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## Certain Violet Names.

By EDWARD L. GREENE.

The rather copious literature of violets which for several years past has occupied much space in several botanical journals of New York and Boston must have been unsatisfactory and even dull reading to as many botanists—they are very many, and scattered all over the country—who are interested in violets in the field, as nature there presents them; also I doubt that any considerable number of botanists, of whatever degrees of proficiency in knowledge of the plants, have found pages of guesses about hybrid origins, and high sounding theorizings about Mendelian laws, able to hold their very serious attention. By way of variety there is now given us a paper of considerable length on some aspects of the violet question that to the writer of the paper seem to have been too long neglected. Its leading points are nomenclatorial. This paper is from the facile pen of Mr. Eugene Bicknell of New York, and of course is far as possible from being dull, or uninteresting.<sup>1</sup> Nevertheless, the man of the facile pen, if proceeding in the name of science, may well be advised to pause, now and then, look up a page of some old volume—or one not so old—and see that his pen tells always the exact truth; for nothing else has permanent place in any science.

On the matter of *Viola obliqua* the first statement of my friend is that "The name seems first to have emerged into the modern light in the Illustrated Flora." It seems to have been entirely forgotten here, that the name *V. obliqua* had "emerged into the modern light" as early as 1886—ten or eleven years before Mr. Bicknell's date of the "emergence"—in the Botanical Gazette, the man who presented it to the botanical public being

<sup>1</sup> *Viola obliqua* Hill, and other Violets. Bull. Torr. Bot. Club, vol. 40, pp. 261-270. June, 1913.

Asa Gray. Its right of priority was as clearly shown there as it was ten years later in the Illustrated Flora. He did not believe in the enforcement of the law of priority in cases of that kind. The name *V. cucullata*, in his view, had been too long in place in all the nineteenth-century books to be now displaced. Now, first of all men to take up that name *V. obliqua*, after Dr. Gray's intimation, and place it on a printed page heading a paragraph, and as the possibly available name for the most common of Potomac Valley violets—I say first of them am I; yet Mr. Bicknell, apparently through failure to distinguish between two ideas that are nevertheless very distinct, now writes me down as the most successful of all who have assailed the name *V. obliqua*. The principal paragraph of his first page opens thus: "More redoubtably than any other writer, more picturesquely, Dr. Greene has used his slings and arrows against this name." Mr. Bicknell appears as having failed to distinguish between things so dissimilar as the name of a plant and the figure purporting to represent the plant. I should say that the name of a plant is one thing, the verbal description of the plant another thing, and a picture of it a third thing. I have inveighed against the figure of *V. obliqua* given by Hill, but nowhere against the name; and so I suppose that what Mr. Bicknell had in mind would have found happier expression if before writing he had looked again to see whether it was a name or a picture that I had spoken against. I am sure that I nowhere wrote against both. A more curious passage in Mr. Bicknell is this: "His onslaught—surely not to be withstood—finally by a hair's breadth evades a fatal issue. With fine dexterity the all but destroyed thing has been rescued and, on the instant, sent forth with now well established rights—for how shall it ever again be assailed with better success?" Here I seem to observe that the writer has now, right in the midst of his paragraph, a new topic; at least one quite distinct from that which he began. He has now joined together the name and the plant. It seems to be affirmed that I had now, at one place, established well the name *V. obliqua* as connected with a certain type. This is a more inexcusable misconstruction of me than the other, if there is any difference. There has been entirely eliminated from my page, in Mr. Bicknell's thought, that interrogation mark. The first thing I wrote on that page which has elicited so much and such pleasing comment was "*V. OBLIQUA*,

Hill?" To the understanding of what I have said in the paper cited, nothing is more needful than the remembrance of that small crooked mark. Its meaning with me is very definite, namely, that I am in doubt as to what the living plant really was to which Hill gave that name. That crooked mark being there, and there bearing its usual meaning, I can not reasonably be credited with having "rescued" the name from ambiguity, or with having sent it forth with "well established rights" as the name for any species. My meaning all the way along and to the end was, and is, that to what species *V. obliqua* as a name applies, is to me uncertain. It has not received from me what Mr. Bicknell denominates "reinstatement," except hypothetically, and that is not reinstatement at all. The utmost accomplished by me in that series of paragraphs is, a showing that the name may possibly turn out to belong there, unless as much as this be made out of my concluding words, that it is matter of probability, which is of course coming nearer to positive affirmation than is possibility; though neither amounts to the positive. I wish that my friend in New York, while he was about it, had reproduced my concluding statement in its integrity, and so had saved me the trouble.

"This species is the most common of all East-American violets, preferring heavy but not wet soils, often growing in great abundance in rather low copses or even somewhat dense moist thickets. Its apetalous summer flowers are on very short horizontal peduncles, the growing ovary being concealed under dead foliage or the lighter mould about the base of the plant. I believe that the species has several specific names already; but I am confident that it can never be proven that it is not *V. obliqua*, Hill; and since that is the oldest possible name of it, I here leave it under that designation."<sup>2</sup>

Now if I well comprehend Mr. Bicknell's interpretation of the last two or three lines, his view is that when I say it can never be proven that a certain species is not *V. obliqua*, Hill, I have in effect neutralized, virtually eliminated my mark of doubt with which I began, so that thenceforward I would have used *V. obliqua*, Hill, simply and plainly for the violet I had in view. Such never was my mind. The doubt expressed at the heading of my paragraphs had not been, nor has it yet been re-

<sup>2</sup> Pittonia, vol. 3. p. 143 (December, 1896).

moved. In my thought, that designation under which I left it was *V. obliqua*, Hill? This written out would be "*V. obliqua*, Hill, perhaps." At that time, as clearly as now, was I well aware of the universal manual-makers' proclivity for universal dogmatism in nomenclature and elsewhere; the certainty that he, the scientific would-be-infallible, will never admit that he is in doubt, will never consent to a question mark after a binary name, in any of his books of botanic dogmatism. If I had indited—if I had edited and published—a monograph of violets covering this ground, or a manual containing our Potomac Valley violets, I should have written *V. obliqua* and some other names with those honest unassuming question marks; so averse am I to pretense of truth where in reality there is only doubt.

On the second page of Mr. Bicknell's article is much positive, even very forcible and emphatic language in defense of Hill's figure as having had for its original a violet which he, Mr. Bicknell, can with perfect confidence demonstrate. He is more ardent for the defense of said figure than I was strong in my "onslaught" on it as worthless, and inasmuch as appeal is frankly made by Mr. Bicknell to others who, as he says, must judge, it is I think to be regretted that a reproduction of Hill's figure was not then and there given. It is the vision of this much written of figure that will convince—perhaps some one way and some another. I believe it has been that old engraving which has persuaded others more recently, as it aforetime persuaded me, not to identify with it except hypothetically any violet of this country that we know.

I am now ready to offer some conciliation. That opinion as to the worthiness of the old *V. obliqua* figure to be taken as a definite token of one specific type, to which I gave strong negative expression seventeen years ago, and that directly opposite opinion which Mr. Bicknell now puts forward, are not so squarely contradictory as at first reading, and without explanation, they will seem; for I had one species in view, and Mr. Bicknell has another; and the two are very dissimilar. That which I was comparing with that old picture is much farther from any approach to answering the requirements of the old picture than is this which Mr. Bicknell is comparing with it. What I had before me was that afterwards published by Mr. Pollard, and with my knowledge and approval as *V. communis*; which same also I, a very few



years subsequently, and with Mr. Pollard's cordial assent, put forward as *V. papilionacea*, Pursh.<sup>3</sup> Now, when Mr. Bicknell informs us that what he is contending for as the real *V. obliqua*, Hill, "is none other than the common violet we have been taught to call *Viola affinis*, Le Conte," I begin to think Mr. Bicknell and I are not at all of two very different opinions as to what plant Hill's miserable figure was meant for. But we can not be found at actual agreement unless we find that each has the same *V. affinis* in view, may be not then; I strongly doubt that either he, or any other man that has been in New York lately except Mr. Pollard has ever seen in its native soil just the plant on which I restored, and as it appears quite effectually, the long unknown or ignored *V. affinis* of Le Conte. What I had before me is a plant locally plentiful in Maryland and Virginia, but the localities are few. It can not, therefore, be called a common violet. For the rest, the common plant of the Hudson River Region, and across to the Connecticut, at least, by my own repeated observation, and which New England people are "taught to call *V. affinis*," is so utterly different habitally, ecologically, and in general specific characters, that I await only time and opportunity to name and publish it as new; for I am sure it is so, and that from my careful field study. It is less like the figure of Hill as to leaf-pattern than is my District of Columbia *V. affinis*. I am not in any position to dispute that my *V. affinis* may reach New Jersey and Long Island, and that Mr. Bicknell may have met with it. But it does not grow far up the Hudson, or the Connecticut, where there abounds, as I have said, a beautiful woodland—rather low-woodland—violet of another nature and character, which all Connecticut "is taught to call *V. affinis*."

I shall now have at once to thank Mr. Bicknell for the information, and humiliate myself in the confession that I think I never knew until now that in Britton's Manual of a dozen years since Mr. Pollard had assigned the name *V. obliqua* to my Le Conte's *V. affinis*. The apologies for my ignorance are several; though I make no apology for the fact that the Manuals and the Illustrated Floras are the books least used by me of all. Seldom is there anything in them for me. But all the botanical world knows that for eight years past the best part of my time and strength have been given to work far different in character from critical taxonomic work. My few weeks of vacation bring me

fine stores of material and notes botanical which lie in their places and wait. One thing, however, I must offer in connection with Mr. Pollard and the *Viola obliqua* matter. It was after I had so denounced the Hill figure of the Hortus Kewensis that there came into my possession that most priceless of American uniques, Le Conte's unpublished plates of violets and bladderworts. In this I saw that that author's representation of his *V. affinis* there was that in its leaf-outline which brought it nearer to that of *V. obliqua*, Hill, than was my own "*V. obliqua*, Hill?", that is, what afterwards became *V. communis*, Pollard. Here, then, was a plant that could with less doubt be identified with *V. obliqua* of the Hortus Kewensis; though still there would be doubt enough about it; at least, so I thought.

I must here interrupt the story of the suppression of *V. affinis*, Le Conte by Mr. Pollard in favor of *V. obliqua*, in order to relate how I came to recognize *V. affinis* myself.

When, at the end of my very first season's recreating in Eastern botany, mostly done in the valleys of the Potomac and Patapsco rivers, I had made those two segregates, "*V. obliqua*, Hill?" and "*V. cucullata*, Aiton?" of the Third Volume of Pittonia, I had already recognized what I conceived to be two ecological conditions of my *V. obliqua*, the less common plant was found only in deeper shades, in moist ground. It had a more elongated and acute, as well as much thinner foliage; also a somewhat different apetalous flowering and fruiting. Most—though not all—of this plant of the long thin foliage was afterwards my *V. affinis*; but I let two more seasons pass, with their opportunities for more research, before I ventured to segregate it finally. I had quite to my satisfaction identified it by Le Conte's description quite anterior to the time when I first saw the unpublished figure referred to; and that only confirmed my earlier determination of it.

Now on the arrival in Washington of the Le Conte botanical art treasure, as my property, I called Mr. Pollard's attention to those longer and more pointed leaves of this plant, as bringing it nearer than any other of our violets to the poor figure of Hill's *V. obliqua*. I recall that Mr. Pollard more than once came back to study that particular plate, and finally to make of me the remarkable request—I do not like to use the less mild term audacious in connection with an old and valued friend—that he

be permitted to make a copy of the plate. Doubtless I might have forgotten the whole circumstance of my friend's very special interest in the fine colored plate under which Le Conte, now ninety years since, had written in pencil "*V. affinis*," but for his surprising request. I now see that Mr. Pollard's purpose was fully formed then, to suppress *V. affinis* in favor of *V. obliqua*; and I repeat, that I never knew he had done so, until now Mr. Bicknell has adverted to the fact in print.

It was never my own thought to displace the name *V. affinis* or any other, and write *V. obliqua* instead. I do not yet know any violet that has the subfalcately cuspidate leaves and perfectly serrate foliage—it is even sharply as well as exactly serrate—of Hill's figure. An artist's error which amounts to an absolute falsification in respect characters held essential should never, in my judgment, be permitted to stand as a specific type; and I strongly suspect that such an opinion as this, conceived by others, had been the reason, and as I think a perfectly valid one, for ignoring the *V. obliqua* as applied by Mr. Pollard in Britton's Manual.

Washington, D. C.

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## A New Midland Violet and Some Notes on "Cleistogamous" Flowers.

(Two Plates.)

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BY J. A. NIEUWLAND.

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### *Viola candidula* Nwd. Sp. Nov.

Planta verna circa 13 cm. alta perglabra, foliis florum altitudinem haud aequantibus. Sepala inferiora circa 7 mm. longa vix acuta, etiam obtusa, vel plus minusve rotundata, glaberrima, obscure 3-nervia, margine anguste scarioso vel membranoso. Corolla alba latior quam longior, petalis superioribus latissime obtusis suborbicularibus, 12 mm. longis 10 mm. latis, vel latioribus, lateralibus breviter sed crebre barbatis pilis longioribus (usque 1.7 mm.) fere cylindricis acutiusculis vel obtusiusculis, brevioribus obtusis vel rotundatis, et omnibus eleganter clavellatis praecipue brevioribus (pilis parte inferiore circa 24  $\mu$  et ad apicem 57-99  $\mu$

diametro.) (Vide figuram.) Petalum inferius aspectu reliquis subaequilongum, concavum, obtusissimum vel minute retusum, nudum, lineis violaceis supra medium vel apicem versus ramosis eleganter notulatis. (Lineae in petalis lateralibus paucae minus ramosae et in superioribus tantum binae vel ternae simplices.) Bracteolae at medium pedunculi breves lineares subulatae appositae. Calcar breve rotundatum purpureis vel violaceis puncticulis exterius coloratum.

Flores apetali aestivi, subterranei sed se ad superficiem fructu facto erigentes, sepalis 5 verisimiliter subaequalibus acutis, ad apicem involutis, et pistillum cum duobus staminibus appresse includentibus, stylo longo brevi hamato vel incurvato staminibus binis appendiculatis alatis compresso: stigmatibus binis vel quaternis staminum antheris appresso. Aliquando tertium adest parvum et omnino sterile stamen inter altera insitum, vel cum duobus vel tribus minutis tuberculis ad pistilli basim. Folia prima reniformia, viridescencia, crassula, rotunda, cordata, apice obtuso vel rotundato, margine crenato vel obtuse serrato. Folia aestiva majora ad apicem plus elongata circa 6.8 cm. lata et usque 7.5 cm. longa, perglabra, vel cum perpaucis minutis pilis in venis ad apicem superficiei.

In locis humidis sed arenosis inter gramina et carices ad stagnorum ripas crescere invenitur.

Spring plant about 13 cm. high perfectly glabrous growing in clumps: leaves never becoming as long as the flowering peduncles until the summer phase, usually about one half as long. Lower sepals about 7 mm. long obtuse or rounded, glabrous, obscurely 3-nerved, the margins narrowly scarious or membranous. Corolla pure white (!) broader than long: the upper petals broadly obtuse or rounded, suborbicular, 12 mm. long, 10 mm. wide or wider, the lateral ovate or obovate, obscurely retuse, bearded with short and long clavate hairs: (the larger hairs 1.7 mm. long about 24  $\mu$  wide below, and 57-99  $\mu$  near their apex; the shorter ones more obtuse or rounded) (Fig. 4.) Lower petal apparently in flower equal in length to the others, concave or somewhat carinate obtuse or slightly retuse, naked, elegantly striped with cross-branched violet lines to above the middle, the striations on the lateral and upper petals are much fewer, only about 3 in the latter. Bracts short subulate linear on the middle of the peduncle.

Sac or spur short, rounded, marked on the outside with minute purple dots.

Apetalous summer flowers subterranean but in their wet native habitat rise to the surface where an abundance of seeds is formed in the capsules. The petaliferous flowers also produce abundant seed. Sepals 5 equal or subequal acute at apex and slightly involute in aestivation (Fig. 2a.) completely closed and appressed to the pistil. Style short permanently hooked or recurved between the anthers and appendages of the two equal stamens. Anther sacs obovoid 2 to 4 in the latter case the two inner smaller, opening by a subapical cleft. At times a third perfectly sterile stamen about one half as large as normal is found between the two usual ones and several tubercles at the base of the ovary mark the other abortive stamens. No trace of petals.

First leaves dark green, thickish, reniform, later rounded cordate, apex rounded or obtuse, or minutely retuse, margin crenulate as the lobes below and crenulate serrate above, about 2.2 cm. wide 2.5 cm. long.

Summer leaves with a more elongated apex often about 6.8 cm. wide and 7.5 cm. long, glabrous or when grown in dry soil with very few minute short hairs at the apex on the upper face or the veins. Habitat wet sandy places near the grassy and sedgy shore of lakes.

This beautiful little plant was first found by me east of Benton Harbor, Mich. in spring of 1909 along the shore of the river flood-pond. Owing to the markedly white flowers and appearance of the broad corolla, several plants were taken and planted in a bed near the University Dept. of Botany, together with a number of other violets. The plants became notable by their remarkable tendency to spread. In the second season numerous seedlings over the whole large bed came to maturity and in spite of digging and cultivation a considerable number have this spring been segregated more carefully to a plot by themselves. This spring another visit to Benton Harbor showed that the plant was spreading there also, though considerably checked by encroachment of cultivated land. Several clumps were taken home for study of fresh material, and transferred to a special plot in order to follow up the subsequent development of latter summer phases, and to study the apetalous flowers more carefully. Though the flowers are perfectly white they are so very large that one could

not consider the plant of the *V. blanda* group. Moreover, though we at first suspected it to be an albino form of some other blue plant, this idea had to be discarded. The other characters of flower and vegetation disproved this completely. Albino forms of *Viola peramoena* were found growing not very far away along the same pond, but even at that early stage showed no resemblance whatever in floral structure. Their subsequent development in our garden emphasized this difference even more in the vegetation summer phases. Other real albinos and intermediate paler forms found by me in woods near the Four Mile Bridge along the St. Joseph River, north of South Bend, also exhibited in summer phases pubescent large leaved plants not at all like *V. candidula*. As far as I have been able to determine the plant is always white flowered. A clump turned over in the meadow by the plowman showed a tendency in the flower to become faintly purplish (not blue or violet) on the back of the petals, whereas even then, the inside of the corollas were white. The descriptions were made from live plants in their native habit. The drawings of petaliferous stages were made from such a plant a few days after being taken from the field. The study of apetalous stages and flowers was made from the same plants grown both in garden, and a potted plant in moister situation. The results in each case were the same though in the latter case fewer apetalous flowers produced seed and more petaliferous ones, and vice versa in the former instances. The plant in its native habitat seems to produce its apetalous summer flowers above ground: whereas in drier situations these are subterranean only, coming above ground after the ovules begin to develop. I may select as a type of this new plant No. 11111 of my herbarium collected at Benton Harbor, May 1913, from which the drawings of the accompanying plate were made before pressing. I have not as yet found the plant elsewhere.

There seem to be two widely different opinions as to the development of the so called "cleistogamous" or apetalous summer flowers of certain groups of caulescent and acaulescent violets. This phenomenon occurs also in the *Antennarias* apparently, in *Polygala polygama* and a considerable number of other plants. Having studied the matter only in the aforementioned new violet, as also in *Viola rostrata* and a midland member of the *Viola pedatifida* group from Southern Illinois, grown in my violet garden,

I do not wish even to hint at any general conclusions regarding the phenomenon as supposed to occur in violets generally.

It has been asserted on the one hand that the so called cleistogamous or apetalous flowers of violets though they may have rudimentary stamens, are entirely devoid of pollen and that therefore no fertilization whatever takes place, that is, in other words the ovules in these aestival flowers develop parthenogenetically. Others have affirmed that fertilization occurs, therefore presuming that pollen or its equivalent is formed and that close fertilization takes place without the opening of the flowers at all.

Whatever examination has been made of other apetalous flowers we need not discuss here. In examining these flowers of the new plant for diagnosis we found that two anther bearing stamens are always present. The anther sacs are two to four in number, in the latter case the two nearest the pistil larger. None of them are, however, never more than one-fifth as large as the anthers of the petaliferous flowers. The pollen grains though comparatively scanty are more than sufficient to account for the fertilization of the numerous ovules. Pollen need not be as copious as in the petal-bearing spring flowers for the proximity of the two stamens pressed against the stigma obviates waste of pollen which in the closed flower can not be readily lost.

I have found a considerable number of such flowers just in the stages in which the enlarging pistil apparently by friction of of growth upwards together with the compression of the sepals on the outside, causes the rupture of these apparently abortive but only more minute anther sacs of the two closely oppressed stamens. The pollen was found in these instances in various stages of germination of pollen tubes, nearly all of which led to the opening in the stigma of the curved or hooked style (See Fig. 3) the progress of the pollen tubes farther in was not made. A more exact histological study would be necessary. Even after tracing the tubes into the ovary, cytological study of the behavior of the chromosomes in the oospores alone would serve as final evidence when fertilization had actually taken place or not. It would seem that the problem would be an interesting and not perhaps a difficult one for general and more exact study.

Developing pollen tubes were found in apetalous flowers which were as a rule not over 4 mm. long and not less than 2.5 mm. In larger flowers the stamens have dried up completely and



as soon as the pollen has escaped the apical membranous appendage of each stamen becomes red. Simultaneously the petiole begins to elongate in the curved portions thus having the two bractlets on the recurved peduncles farther away than the apex of the sepals. A certain variation of these characters is found in subterranean and aerial apetalous flowers. In the plant under consideration as well as of a number of other acaulescent forms where the apetalous flowers are born under or near the ground the peduncles are recurved below the flower, and the short style is always found curved towards the peduncle. The two stamens also are on the side of the pistil facing the recurved stalk of the flower (See Fig. 1a). Of all the specimens which I have examined in sufficiently early stages of growth, I have found either well developed pollen grains in the undehiscent anthers or when already dehiscent, the pollen tubes growing from the grains into the stigma and style. I have not found a single apetalous flower entirely devoid of well developed stamens. The pollen grains are readily seen with the low power of an ordinary compound microscope, one inch ocular and two-thirds inch objective. (Fig. 3.)

Before dehiscence particularly the pollen grains vary greatly in size. The walls are not as thick as in those of the petaliferous flowers, which average about  $37.5 \mu$ , the variation being only two or three microns. Those of the apetalous flowers range from  $23.7 \mu$  to  $52 \mu$  in diameter, and have not the peculiar three plate lids on the surface through which the pollen tubes find their exit, characteristic of the pollen of the petal bearing flowers.

Pollen in stages producing pollen tubes were also found in the few apetalous aerial flowers of *Viola rostrata* examined. In this the peduncle is not recurved below the flower; the style with more or less abruptly recurved stigma is longer and the spatulate stamens are five in number instead of the two of the acaulescent forms. Should further examination of caulescent and acaulescent violets substantiate this variation in number as constant, a new and important character of distinction of the groups is presented helping to emphasize the fact that they may well be considered, as Spach does, to be different natural genera.

PLATE 2.—*Viola candidula* Nwd. (Natural size.) Parts of spring flower separated. Drawn in late spring phase as the apetalous flowers were beginning to appear, one larger summer leaf also shown. Lower right hand corner: ovary. Same with stamens in place, upper petal, lateral petal, lower petal.

PLATE 3.—Parts of apetalous summer flowers, and (fig. 4) hairs of lateral petals of spring flowers of *Viola candidula*.

FIG. 1a.—Pistil of apetalous flower with stamens appressed to the stigma. (Side view.) A minute sterile stamen on the left between the two fertile ones.

FIG. 1b.—A fertile stamen with four anther sacs. Pollen escaping from the subapical cleft in the two larger sacs. Rudiment of another sterile stamen at the base. [Magnified about 30 diameters].

FIG. 2a.—Cross section showing arrangement of the parts of the apetalous summer flowers. A, position of the recurved petiole. B, sepals, subequal. C, 2 stamens bearing fertile anthers and inserted always next to the petiole A. (The third sterile stamen is ordinarily absent.) D, ovary with ovules.

FIG. 2b.—Front view of pistil with two stamens. (Same as Fig. 1a of another flower without the third sterile stamen.)

FIG. 3.—Side view of recurved style and stigma showing pollen grains sending pollen tubes into the hollow style.

FIG. 4.—Hairs of the beard of the lateral petals greatly magnified. The hairs are spirally striate under high magnification and round, not flattened except in age.

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## Some Littoral Algae of Puget Sound.

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The following study was made at the Puget Sound Marine Station, during the summer of 1909, mainly in the months of July and August. A general survey of the ground had been made the previous summer. Its purpose was to determine what types of algae inhabit the tide-pools; why they prefer these places and how they are specially adapted to such places. The study was made with special reference to *Prionitis*, which seems to be the one prevailing type in all these tide-pools, and showing considerable variation with variety of environment.

The work was suggested and outlined by Professor T. C. Frye, acting director of the Station. No such study had yet been made in this region, though a study somewhat similar in its general character was made by Skinner (8) at Port Renfrew, B. C. The conditions there are quite different, and his study does not attempt to relate types to environment, nor is it specially directed to any

particular form. In the 1906 Postelsia there is a report by Isabel Henkel (3) on the tide-pools near Port Renfrew, B. C. from the standpoint of their origin. It is mostly geological in character and only incidentally refers to the algae there found. In that place the tide-pools are of unusual character, large and deep, mostly in sand-stone. In my study the term tide-pool includes anything from a few pints to many gallons, left by the receding tide or splashed by the spray above tide-mark.

The plants were identified by comparison with the collection at the Station and are named according to Setchell and Gardiner's "Algae of North-western America," except Nos. 1 and 2, which were identified and named by comparison with the private collection of A. S. Foster of Aberdeen, Wash. and with the collection at the University of Ill. in which these were named by Professor Tilden of the University of Minnesota. No. 3, also, is the name given by Professor Tilden to a specimen from the north end of San Juan Island, closely resembling, if not identical with those classed by me under that name. There was some doubt as to whether all the *Prionitis* should be classed as variations of one species or as distinct species. Setchell, (5) discusses the same question in regard to *Ulva*, holding that it is merely one species, with much variation due to differences of environment.

The list of places named does not pretend to cover the entire Sound region but it is fairly typical and sufficiently exhaustive. There are no pools at the south end of the Sound, where the shores are mostly of clay or gravel. They are best represented about the island regions and are most typical where these studies were made. In an Ecological study by Wylie (9) of a small rocky island off the south end of Lopez Island *P. Lyallii* is reported further south than any point studied by me. Many regions were studied or noted that are not included in this report. Only those were included which were considered most typical. They were mostly made at extreme low tide in order to make comparisons possible. They are numbered in the order in which they were studied.

I. Brown's Island, chiefly west side and south end.

1. *Melobesia marginata*, forming reddish-brown incrustations on rocks at the high-tide line and in shallow pools.
2. *Peyssonnellia dubia*, rather thick incrustations in crevices

or other protected places, from mid-tide to lowest visible depths; sometimes on loose rocks or shells.

3. *Prionitis lanceolata*, in tufts on the margin of the pools.

4. *Prionitis Lyallii*, coarser, less divided and lighter colored than No. 3 and characteristic of mid-tide or deeper.

5. *Polysiphonia californica*, growing in fine masses in the deeper water; sometimes in shallow water or on loose rocks.

6. *Rhodomela larix*, growing in large coarse masses in deeper water, and, most abundant at low tide.

II. Shaw's Island, south end; pools larger, greater variety in size, elevation and light relation.

No. 1, almost wholly absent in this region; cause unknown.

No. 2, good display at lower depths in protected crevices.

No. 3, abundant at mid-tide, showing marked contrasts in size of plants and profusion of branching.

No. 4, large size, mid fronds nearly a foot long; branching, less profuse, lateral; color, yellowish.

No. 5, a small amount at low tide.

III. Minnesota Reef, a rock about two miles south-east of I. totally submerged at extreme high tide (spring-tide) and hence was visited at the ebb of spring-tide. It is very rich in amount and variety of material, but is not strictly tide-pool in character at all times.

No. 1, very rare and of little importance here.

No. 2, abundant; some on shells and loose rocks and it could be seen at inaccessible depths.

No. 3, present in considerable quantities, finely divided.

No. 4, as described in II, good specimens. This varied enough to suggest two or three species or varieties.

No. 5, in great masses; optimum conditions.

No. 6, as in I. almost below tide-pool conditions.

No. 7, *Ulva lactuca*, in medium abundance at low tide.

No. 8, *Gigartina mammilosa*, not abundant nor important.

*Corallina* and *Amphiroa* were also found here in considerable abundance, but scarcely in tide-pool conditions; hence they will receive no further consideration. These have been treated in a monograph by Yendo (10).

IV. Unnamed rock,  $\frac{1}{2}$  mile south of III. This gave the same indications as III. with greater variety in *Prionitis*, as it extends above high-tide, affording small pools filled by spray

and always exposed to sun and air; consequently warmer than pools below the tide-line; sometimes reaching 70°F. At this and the previous place, III., temperatures were taken; they ranged from 53°F to 63°F. Thus, allowing 10 ft. between low and high (it is nearly 12 ft.) there is an average difference of 1° for each ft. of altitude.

V. Argyle Bay. This is really the outlet to a large pond or basin that is drained almost completely when tides are lowest. The flood comes in over an expanse of warm gravel and the pool is shallow so the water may reach at times a temperature of 60° to 70°F. At the outlet the water is constantly flowing either in or out with considerable current, thus renewing the air and food supplies.

Nos. 1 and 2 are not found here as the banks are loose gravel instead of solid rock; and the quiet water conditions of other places do not exist.

No. 4, however, is found attached to large pebbles on the bottom and attaining great size; fronds over a foot in length and over an inch in width.

No. 5, also in great abundance fastened to pebbles.

Nos. 6, 7 and 8, though present are rare and not important, but No. 9, *Entermorpha linza* finds this a most congenial place.

VI. Roche Harbor, Henry Island and Ship Island. These show nothing new and are of interest only in so far as they confirm the conclusions already reached in the study of *Prionitis* and its variations elsewhere.

VII. "Gull Rocks," just off west side of Waldron Island. Excellent pools, varying in size and altitude, but containing almost nothing of interest except *Prionitis*. The conditions as to altitude, temperature, etc., are similar to those described under IV.

VIII. Kanaka Bay, also known as False Bay, south end of San Juan Island, drains completely at extreme low tide, when study was made east side of entrance.

This afforded a number of small pools and one larger than any found elsewhere; especially good. Although there is a great variety of material in this region there was nothing new in tide-pool conditions, except 10, *Soranthera* sp. *Prionitis* shows a greater variety of size and form here than possibly in any other place examined. It is doubtful whether it could all be classed under the two species, 3 and 4. Possibly it should all be classed as one

species with much variation due to difference of environment.

IX. Sucia Islands, south side.

This was excellent ground for this study. The rock is softer and larger pools have been worn in them. They are more exposed to the sweep and surge of the tide and surf and better test the character of *Prionitis*. This region is a resumé of all the others with enough new features to settle some of the problems raised by them. In other places the plants were more protected, which seemed to account for the presence of *Prionitis* rather than the higher temperatures or better light exposures. Long troughs are cut in the sea-floor which retain sufficient water at lowtide to support large quantities of *Prionitis*, but none is found there, evidently because the waves and tide sweeping the full length of the troughs sweep out this seemingly fragile plant, which is not adapted to such a strenuous existence. Why it has not become so adapted is another question.

DISCUSSION.

*Prionitis* is probably the only alga found exclusively in tide-pools and not elsewhere. It is found outside of tide-pools, properly so called and at greater depths than these, but in tide-pool conditions, essentially, and hence real tide-pools. *Rhodomela* seems to prefer the pools and probably for the same reason as *Prionitis*. Although abundant and nearly always found associated with the former, it is also found in crevices and protected places, in essentially tide-pool conditions, but deeper than its associate. It seems to shun extreme light and higher temperatures, which are found at higher altitudes. I thought at first that the plant went deeper only to find a firmer anchorage and shunned loose rocks, but I afterwards found it on rock fragments and shells; but these must, however, be protected from rolling and abrasion.

*Prionitis* is also more abundant where *Rhodomela* or like plants are present to afford protection; whether as points of attachment for young plants or later against strong currents is not apparent. It is preeminently not a surge-plant. It must have a protected nook or hollow. It does not grow on a sloping ledge as does *Calpomenia*; nor on a sheer rock wall as does *Fucus*; nor on a surf-beaten shore as does *Postelsia*. It exudes no slime and can not endure exposure to the air as does *Fucus*. It must grow in a pool or some protected place where it may secure much flowing

water, as at Argyle Bay, and frequent exposure to the air for a short time is advantageous. Exposure to light seems to be of secondary importance.

Its presence in tide-pools may be due, in part to the abundance of animal life there, such as small crabs, snails, etc., which would furnish abundant  $\text{CO}_2$  and preserve the well-known balance of plant and animal life. According to this view, however, if true, *Prionitis* should be able to grow in the center of pools as well as on the margins; but there it is not found. Possibly the gases accumulate on the margin. This point was not investigated for want of apparatus. This would be interesting and perhaps a profitable point for future investigation.

It was suggested at the outset that the difference in dissection, greatest at the top or upper tide-line and above, might be an adaptation to higher temperatures which would diminish the amount of gas and hence call for more exposure surface, which could be accomplished by more minute dissection of the fronds. This, however, does not seem to be true. In fact the opposite tendency is shown by Theoderesco (7) who, using certain liverworts for his investigations, found that the fronds of the thallus became shortened and more dissected when the concentration of the  $\text{CO}_2$  was increased.

This question was later taken up by the writer (2) in a somewhat extensive study on freshwater algae in which it appears that the plant body becomes more compact when the  $\text{CO}_2$  accumulates and that the alga is much concerned with its oxygen relation as well as with that of  $\text{CO}_2$ .

In this connection I would cite the luxuriant growth of *Ulva* and *Alaria* at Olga and at Cattle Point, in the quiet shallow bays where the water becomes quite warm,  $64^\circ\text{F}$ . or more. These, with their broad thin leaves, are not adapted to rough water nor even to a strong current, but to quiet shallow bays with a pebbly bottom.

The finer dissection of *Prionitis* at the higher altitudes seems to be an adaptation to meet the force of the surf and strong currents, while the broad, simple fronds of the deeper levels are adapted to more quiet waters, and are especially prominent at Argyle Bay, where there is no surf but only a strong uniformly flowing current which rapidly renews the supply of  $\text{CO}_2$  without the danger of dislodgement or tearing. It is worthy of note that the light ex-



posure is as great here as elsewhere. Rigg (4) mentions the fact that certain kelps show a variation in thickness and other features of form, coordinate with different degrees of exposure to violence of waves. Whether the dark brown color of the topmost plants, as contrasted with the yellowish tinge of the lower ones could be a color adaptation was not considered.

Setchell (6) mentions this color variation in kelps with increase of depth but does not offer any explanation nor suggest any idea of adaptation. Blackman (1) however, agrees with Gaidukov in the notion that the yellow color found in deeper waters is a chromatic adaptation to the complementary color of the rays coming through the blue water.

The problem of *Prionitis*, then, seems not to be so much the procuring of greater light and a warmer temperature but the supply and exchange of gases. In the pools the plants could attach themselves to the bottom as well as to the margin; but air and presumably CO<sub>2</sub> are not available at the bottom. So it seems that the small plants must begin life and the adults continue to remain around the margins, where gases are available and to do this must adapt themselves to a life of exposure on the one hand by increased dissection of the fronds, increased toughness and darker color and diminished size while the opposite of these are suited to a sheltered life.

#### CONCLUSION.

1. *Prionitis* is adapted to a considerable range of temperature, but seems to prefer the warmer places.
2. *Rhodomela* is adapted to nearly as wide a range of temperature, but seems to prefer the cooler places.
3. Both seek protected nooks and pools.
4. The problem of *Prionitis* seems to be that of food (CO<sub>2</sub>) and shelter rather than of heat and light.

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- coast of Vancouver island. *Postelsia*, Year Book Minn. Seaside Station 1906: 277-304. 1906.
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  7. Teodoresco, M. E. C. Influence de l'acide carbonique sur la forme et la structure des plantes. Rev. Gen. de Bot. 11: 445-470. 1899.
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## Notes on Our Local Plants.—IV.

BY J. A. NIEUWLAND.

### Order II. XYRIDALES.

Britton, Man. 2nd. ed. p. 234. (1905.)

Family 24. **XYRIDEAE** Salisb. Trans. Hort. Soc. 1, p. 326, (1812). H. B. K. Nov. Gen. I., p. 203, (1815). Dum. An. Fam., p. 55, (1929), Agardh, Aphor. Bartling Ord. Nat., p. 23 and 27, (1830), also Spach, Hist. Nat., p. 131, (1846). Desv. Ann. Sc. Nat. V. 13, p. 149, (1836). *Xyridaceae* Lindley Nat. Syst. ed. 2, p. 388, (1836).

*KOTSJILLETTIA* Adans. Fam. des Plantes, 2, p. 60, (1763) ex Rheede. Hort. Mal. 9, t. 7, p. 139.

*XYRIS* Gronovius. Fl. Virg. p. 11, (1739), also Fl. Zeylan. p. 35. Linnaeus, Gen. Pl. p. 11, (1737)<sup>1</sup>, p. 24, (1742). Sp. Pl.

<sup>1</sup> Referred by Linnaeus to Gronovius here, and hence credited above to that author, even though first found used by the former.

p. 42, (1753). Syst. p. 91, (1756). Van Royen, Fl. Leyd. p. 20, (1740). not *Nyris* of Theophrastus, Dioscorides, Gesner, Parkinson, p. 256, (1629), nor of pre-Linnaean authors generally = *Iris foetidissima* Linn. *Schizmaxon* Steudel, Bot. Zeit., p. 391, (1856). An hoc seg. (?) *Jupica*, *Ramotha*, *Synoliga* Raf. Fl. Tell. II., p. 15, (1836).

**Kotsjillettia flexuosa** (Muhl.)

*XYRIS FLEXUOSA* Muhl. Cat. 5, (1813).

Laporte Co. (Barnes), Lake Co. (Hill), Lake Maxinkuckee [Marshall Co.] (H. W. Clarke), Sheffield, Ind. [Lake Co.] (Higley & Raddin), Tamarack [Lake Co.], Mineral Springs [Porter Co.].

Family 25 **ERIOCAULONEAE** L. C. Rich. An. Mus.

Paris, v. 17, p. 52, (1811).

*Eriocaulaceae* Dum. An. Fam. p. 55, (1829) also Bartling, lc. p. 36, as a subfamily.

*Eriocaulaceae* Lindley, Veg. Kingd. p. 122, (1847).

**ERIOCAULON** Plukenett, Amalth. t. 409, f. 5, (1705).

*Eriocaulon* Linn. Gen. Pl. p. 35, (1742); p. 38, (1754); Syst. Nat. p. 92, (1756); Sp. Pl. p. 87, (1753); Gronovius Fl. Virg. p. 13, 14, (1739). *Randalia* Petiver, Gaz. t. 6, f. 2, (1702, 1769); also Beauv. ex Desv. Ann. Sc. Nat. Ser. I., p. 47, t. 5, XIII., (1828).

*Eriocaulon septangulare* With. Bot. Arr. Brit. Pl. p. 784, (1776).

*Nasmythia articulata* Huds. Fl. Angl. Ed. 2., p. 415, (1778).

*Eriocaulon articulatum* (Huds.) Morong. Bull. Torr. Cl. 18, p. 353, (1891).

[Laporte Co.], (Hill); Bass Lake, [Marshall Co.]; St. Joseph River, [St. Joseph Co.]; Mineral Springs, [Porter Co.]; Bankson Lake, [Van Buren Co., Mich.]; N. D. U. Herb. 2430, 2254, and 9503.

Family 26. **COMMELYNEAE** R. Brown. (1810).

*Commelinaceae* Reichenb. Conspect. p. 57, (1828), also Lindley Nat. Syst. Ed. 2, p. 354, (1836). *Commelyneaceae* C. B. Clarke Monogr. Phaner. III., p. 131, (1881).

**COMMELINA** Plumier Nov. Pl. Am. Gen. p. 48, (1703); also Linn. Syst. (1735); Gen. Pl. p. 21, (1737); p. 23, (1742); p. 25, (1754); Hort. Cliff. p. 21, (1737); Sp. Pl. 40, (1753); Van Royen, Hort. Leyd. p. 38, (1740); Boerhaave, Ind. Alt. Pl. p. 237, (1720), (1727).

*Commelina virginica* Linn. Sp. Pl. ed. 2, p. 61, (1762).

St. Joseph and Benton Harbor, Mich. [Berrien Co.]; Lake Co., (Hill). Miller's [Lake Co.] Babcock. St. Mary's [St. Joseph Co.] N. D. Herb. 9415. I have found it in several other places in the county notably at South Bend where it escaped from gardens. The plant, appears every year around dumps and in barnyards along fences, when once established.

*TRADESCANTIA* Linn. Syst. (1755); Gen. Pl. p. 98, (1737); p. 37, (1742); p. 38, (1754); Hort. Cliff. p. 126, (1737); Sp. Pl. p. 288, (1753); Van Royen Lugd. p. 37, (1740).

*Ephemerum* Morison, Oxon. p. 506, (1635): Tour. Els. Bot. p. 295, (1694); I. R. H. p. 357, (1700); Moench. Meth. p. 23, (1794) not *Ephemerum* Dioscorides = *Polygonatum multiflorum*, nor *Ephemerum* Theophrastus. *Ephemero-phalangium*<sup>2</sup> Magnol Charact. p. 241, (1720).

*Tradescantia virginica* Linn. Sp. Pl. p. 288, (1753), *Ephemerum congestum* Moench. lc. p. 238.

Found by me only in the dune region of Lake Michigan at Dunè Park, Ind. [Lake Co.]; also at Millers, Ind. The plant is much smaller than the following for which it is often taken. The plant may even be distinct from the eastern type.

*Tradescantia reflexa* Raf. New Fl. N. Am. II., p. 87, (1836).

Lake Maxinkuckee, (H. B. Clarke) (?) probably. Clarke, [Lake Co.] (Umbach); [Marshall Co.] (Deam); [St. Joseph Co.] (Powers); N. D. Herb. No. 1953; Chain Lake [St. Joseph Co.] N. D. Herb. No. 2087. A perfectly white flowered specimen was collected near Warwick [St. Joseph Co.]. The bracts of the involucre are not reflexed.<sup>3</sup> I have found this common plant in all the counties with the range of the notes, and in numerous places in every county.

Family 27. **PONTEDEREAE** H. B. K. Nov. Gen. and Sp., 1; p. 265, (1815).

*Pontederiaceae* Dum. An. Fam. Pl. p. 59, (1829); also Meisner, Gen. p. 298 [300], (1842), etc.

<sup>2</sup> Name ineligible because too long and composite.

<sup>3</sup> Am. Mid. Nat., Vol. 2, p. 265.

*NARUKILA* Rheede H. M. v. 11. t. 34, (1692); also Adans. Fam. des. Pl. p. 54, (1763).

*PONTERERIA* Linn. Syst. (1735), Gen. Pl. p. 102, (1737); p. 138, (1742); p. 140, (1754); Hort. Cliff. p. 133, (1737); Sp. Pl. p. 288, (1753); Gronovius, Fl. Virg. p. 37, (1739). *Michelia* Houston, ex Linn. Gen. Pl. (1742) p. 138 MSS. ined usque (1784-1791) not *Michelia* Linn. Syst. (1735) and p. 118 Syst. (1756), nor Linn. Gem. p. 119, (1756), nor Sp. Pl. 577, (1753).

***Narukila cordata* (Linn.).**

*PONTERERIA CORDATA* Linn. Sp. Pl. 1. c.

Miller's Ind. (Umbach); [Laporte Co.] Barnes; [Lake Co.] (Deam); [Marshall Co.] (Coulter); Lake Maxinkuckee, H. B. Clarke; Miller's, Ind., U. N. D. Herb. No. 2153; Hudson Lake [Laporte Co.] No. 741; Bankson Lake, No. 656. I have found it in every county.

***Narukila cordata* var. *lancifolia* (Muhl.).**

*Pontederia cordata* var. *lancifolia* (Muhl.) Morong. Mem. Torr. Cl. 5: p. 105, (1896). *Pontederia lancifolia* Muhl. Cat. 34, (1813). A good specimen from Millers, Ind. collected by Umbach is in the U. S. National Herbarium.

***HETERANTHERA*** R. & P. Fl. Peruv. & Chil. Pr. p. 9, (1794).

*Schollera* Schreb. Gen. p. 785, (1789), not *Schollera* Roth. Tent. Fl. Ger. 1. p. 165, 170, (1788).

*Heteranthera dubia* (Jacq.) MacM. Met. Minn. p. 138, (1892). [Laporte Co.] Barnes; Lake Maxinkuckee [Marshall Co.], H. W. Clarke.

**Order 12. LILIALES.**

Britton, Man. p. 244, (1905) in part.

Family 28. **JUNCOIDEAE** Gerard, Fl. Gallo Pr. p. 138, (1761).

*Juncaceae* Vent. Tabl. 2, p. 150, (1799).

***JUNCUS*** Pliny, Hist. Nat. and of all pre-Linnaean writers.

*Juncus* Tour. Els. Bot. p. 212, (1694); I. R. H. p. 246, (1700); Linn. Syst. (1735); Gen. Pl. p. 104, (1737); p. 150, (1742); p. 152, (1754); Sp. Pl. p. 325, (1753).

**Juncus effusus** Linn. Sp. Pl. p. 326, (1753).

Lake Maxinkuckee, (H. W. Clarke); [Lake Co.] (Hill); [Laporte Co.] (Deam); etc. I have found it in all the counties in the range. No. 9347, Notre Dame.

**Juncus balticus** Willd. Berl. Mag. 3. p. 298, (1809).

[Lake Co.] (Hill); [Lake & Laporte Cos.] (Deam); Millers, Ind. [Lake Co.]; No. 581 and 9347, U. N. D. Herb.; Tamarack and Mineral Springs [Porter Co.]; [Van Buren Co. and Berrien Co.], Mich.

**Juncus bufonius** Linn. Sp. Pl. p. 328, (1753).

Lake Maxinkuckee (H. W. Clarke); [Porter Co.] (Deam); [St. Joseph Co.]; Tamarack [Porter Co.]; Benton Harbor [Berrien Co., Mich.]; [Van Buren Co., Mich.].

**Juncus tenuis** Willd. Sp. Pl. 2, p. 214, (1799).

[Lake Co.] (Hill); Notre Dame, N. D. Herb. 276 and 9309; Lake Maxinkuckee (H. W. Clarke). I have found it in every county.

**Juncus Greenii** Oakes & Tuckerm. Am. Jr. Sci. 45 p. 37, (1843).

[Lake Co.] (Hill); Miller's, (Bastin); Whiting, Ind. [Lake Co.] (Higley and Raddin).

**Juncus marginatus** Rostk. Monog. Junc. 38, pl. 2, f. 3, (1801).

[Lake Co.] (Deam); Whiting, Ind. [Lake Co.] (Higley & Raddin).

**Juncus canadensis** J. Gray. Laharpe, Monog. Junc. p. 134, (1825).

Lake Maxinkuckee (L. C. Clarke); [Laporte Co.] (Deam); Millers (Hill) also (Higley & Raddin); Tolleston & Pine (Hill).

**Juncus pelocarpus** E. Meyer, Syn. Luz. p. 30, (1823).

Fish Trap Lake, [Laporte Co.] (Deam); [Laporte Co.] (Barnes).

**Juncus robustus** (Engelm.) Coville in Britton, Ill. Fl. N. Am. 1. p. 395.

Lake Maxinkuckee (L. C. Clarke).

**Juncus richardsonianus** Schult. in R. and S. Syst. 7, p. 201, (1829).

[Lake Co.] (Deam, also Hill); Colehour & Casella, Ind., Sheffield Ind. (Hill).

**Juncus nodosus** Linn., Sp. Pl. Ed. 2, p. 466, (1762).

[Lake Co.] (Hill); Millers (Hill); Berry Lake [Lake Co.] (Higley & Raddin); Notre Dame, South Bend, Webster's Crossing, etc. [St. Joseph Co.]. Nos. 11207 and 11208. Very common.

**Juncus Torreyi** Coville, Mem. Torr. Cl. 22, p. 303, (1885).

[Laporte Co.] (Deam); [Lake Co.] (Deam also Hill.)

**Juncus brachycarpus** Engelm. Trans. St. Louis Acad. 2, p. 467, (1868).

[Marshall Co.] (Deam).

**Juncus scirpoides** Lam. Encyc. Meth. Bot. 3, p. 267, (1789).

[Laporte Co.] (Hill); Tolleston (Hill); Millers (Bastin).

**Juncus brachycephalus** (Engelm.) Buch. in Engelm. Bot. Jahrb. 12. p. 268, (1890).

**Juncus canadensis** var. *brachycephalus* Engelm. Trans. St. Louis Acad. 2, p. 474, (1868).

[Lake Co.] (Deam); [Laporte Co.] (S. Coulter).

**Juncus Dudleyi** Wiegand, Bull. Borr. Bot. Cl. p. 524, (1900).

[Laporte Co.] (Deam).

**Juncus acuminatus** Michx. Fl. Bor. Am. I, p. 192, (1803).

Millers, (Hill); Lake Maxinkuckee (L. C. Clarke); Pine, Ind. (Higley & Raddin).

**LUZULA** Anguillara, Semp. (1561) also *Luzula* De Candolle, Fl. Fr. 3, p. 158, (1805); *Cyperella* V. Cordus, Annot. (1561); also Conrad Gesner, Hort. Germ. (1561); *Luciola* Caesalpinus De Plantis, p. 185, (1583); also Smith Engl. Fl. p. 177, (1824); **JUNCOIDES** Micheli Nov. Pl. Gen. p., (1729); also Moehring, and Adanson, Fam. des Pl. p. 47, (1763); Scheuchzer, Agrost. p. 310, (1719) & (1775); *Juncodes* O. Kuntze. Rev. Gen. II., p. 722, (1891). *Ischaemon* Schmiedel in Ges., Hist. Pl. p. 13, (1759), not *Ischaemum* Linn. Gen. Pl., p. 529, (1742), nor Sp. Pl.

**Luzula campestris** (Linn.) D. C. l. c.

**Juncus campestris** Linn., Sp. Pl. p. 329, (1753).

**Juncoides campestre** (Linn.) Britton. Fl. N. Am. 1, 398, (1896).

Lake Maxinkuckee (Clarke); I have found the plant in all the counties in the range. Very common and abundant. U. N. D. Herb. No. 3315; Benton Harbor, Mich. [Berrien Co.], No. 10099; 11108 and 11106, Mineral Springs [Porter Co.]; No. 9142 Stude-



baker's Woods, South Bend, [St. Joseph Co.]; Nos. 11058, 11152 and 9115 North of Notre Dame.

*Luzula saltuensis* Fernald. Gray's Man. 7th Ed. p. 279, (1908).

I have found this plant only in two widely different places. East of Benton Harbor [Berrien Co.], Mich. No. 11032, and North of Notre Dame at Webster's Crossing, No. 11199, U. N. D. Herb.

Family 29. **MELANTHACEAE** R. Brown Prod. I,  
p 272, (1810).

*Melanthideae* Dum. Comm. Bot. p. 66, (1823); also Fl. Belg.  
p. 141, (1827).

*TOFIELDIA* Hudson, Fl. Augh. Ed. 2, p. 157, (1778).

*Tofieldia glutinosa* (Michx.) Person, Syn. I, p. 399, (1805).

*Narthecium glutinosum* Michx. Fl. Bor. Am. 1, p. 210, (1803).  
[Lake Co.] (Hill, also Deam); Pine, Millers & Edgemoor  
(Higley & Raddin).

*UVULARIA* Linn. Gen. Pl. p. 95, (1737); p. 143, (1742; p. 144,  
(1754); Hort. Cliff. p. 121, (1737); Sp. Pl. p. 304, (1753); Van  
Royen, Hort. Lugd. p. 29, (1740).

*Uvularia grandiflora* J. E. Smith, ex. Bot. 1, p. 99, pl. 51,  
(1894-1805).

[Laporte Co.] (Deam). Common in all the counties. U. N. D.  
Herb., 3243, 1988, 1989. Notre Dame (Powers), No. 2718; Stephens-  
ville [Berrien Co.], Mich.

*MELANTHIUM* Linn., Gen. Pl. p. 524, (1742); Sp. Pl.  
p. 339, (1753).

*Melanthium virginicum* Linn., Sp. Pl. l. c.

West of South Bend, Ind. [St. Joseph Co.]; N. D. U. Herb.,  
No. 2746. Still rather abundant but will soon disappear by reason  
of draining of swamps, and encroachment of cultivation.

Family 30. **ALLIACEAE** Batsch, also *Alliaceae* Dum. An.  
Fam. p. 61, (1829) as a tribe of *Liliaceae*. *Cepaeae* Salisb., Gen.  
Pl. Lir. p. 88, (1866) as order. *Allieae* Kunth, Enum. pl. 4, p.  
379, (1843).

*VALIDALLIUM* Small, Fl. S. E. U. S. p. 264, (1903).

*Aglithei*s Raf. Fl. Tell. II., p. 17, (1836)? or *Geboscon* Raf.

Cat. 14, (1824), Fl. Tell. (?) l. c. Adest quaedam confusio et nomina incerta?

*Allium* Linn. l. c. in part.

**Validallium tricoccum** (Ait.) Small l. c.

*Allium tricoccum* Ait. Hort. Kew. 1, p. 428, (1789).

[Porter Co.] Deam); N. Liberty, Ind. [St. Joseph Co.]; N. D. U. Herb. N. 527, 827. I have found it also at Lapaz Junction [Marshall Co.]; No. 11206 S. of South Bend, Studebaker's Woods [St. Joseph Co.]; Munich and Scottdale, Mich. [Berrien Co.].

**ALLIUM PLINY.**

*Allium* Tournefort, Els. Bot. p. 304, (1694), also I. R. H., p. 383, (1700); Linn. Syst. (1735); Gen. Pl. p. 103, (1737); p. 141, (1742); p. 143, (1754); Sp. Pl. p. 294, (1753); Royen, Hort. Ludg. p. 38, (1740); and of all the pre-Linnaeans generally.

Old genus *CALLIPRENA* Salisb, l. c. p. 89.

**Allium cernuum** Roth. Roem. Arch. 1, pt. 3, p. 40, (1798).

Lake Maxinkuckee (Clarke); [Lake Co.] (Hill); [St. Joseph Co.] (Barnes). Abundant in places. I have found it in Porter, St. Joseph, Laporte, Berrien and Van Buren Co., U. N. D. Herb. 9326, 899, 2758.

**Allium canadense** Linn., Sp. Pl. p. 1195, (1753).

Granger, Ind. [St. Joseph Co.]; also [Elkhart Co.]; Notre Dame No. 11209.

Old Genus *HEXONYCHIA* Salisb. p. 88, l. c.

**Allium stellatum** Ker., Bot. Mag. pl. 1576, (1813).

In Kosciusko Co., acc. to State Cat.

**Allium vineale** Linn. Sp. Pl., p. 299, (1753).

[St. Joseph Co., also Berrien Co.], scarce.

Family 31. **LILIACEAE** Clusius, Panon. p. 231, (1585); Linnaeus, Phil. Bot. p. 28, (1751); also p. 28, (1755); Zinn, Cat. Pl. Gott. p. 89, (1754) in part Haller. Enum. Pl. Hort. Gott. p. 19, (1753).

*Asphodeleae* Bartl. Ord. Nat. Pl. p. 49, (1830).

Subfamily. **TULIPACEAE**. Bart. l. c. p. 50.

*Lilioidaeae* Engl. Fuhrer Bot. Gart. Bres. p. 25, (1886).

*LILIUM* Pliny, Vergil, Columella, X. 99, etc.

*Lirion* Theophrastus, Theocritus; *Lirium* Linnaeus Syst. (1735); Hort. Cliff. p. 120, (1737); *Krinon* Dioscorides, 3, 116. *Lilium* J. Bauhin. Tour. Els. Bot. p. 297. (1694), I. R. H. p. 369, (1700); *LILIUM* Linn., Gen. Pl. p. 91, (1737); p. 142, (1742); p. 143, (1754); Sp. Pl. p. 202, (1753).

*Lilium umbellatum* Pursh, Fl. Am. Sept. o, 228, (1814).

*Lilium andinum* Nutt. Fras. Cat. (1813) nomen nudum.

Olivers, West of South Bend. Meadow and Railroad U. N. D. Herb. No. 2741 and 2742.

*Lilium canadense* Linn., Sp. Pl. p. 303, (1753).

Lake Maxinkuckee, (Clarke), also [Marshall Co.] (Deam).

*Lilium superbum* Linn., Sp. Pl. Ed. 2, p. 434, (1762).

[Laporte and St. Joseph Cos.] (Barnes); Notre Dame, Ind. U. N. D. Herb. No. 1821; Bankson Lake, Mich. [Van Buren Co.]; Nos. 2334, 9093 U. N. D. Herb. I have found this in Porter, Elkhart, Berrien, Lake and Laporte counties also. Rather common and abundant.

*Lilium tigrinum* Andr. Bot. Rep. 9, (1809).

Escape into the woods at Notre Dame, growing perfectly wild and maintaining itself as also spreading.

*ERYTHRONIUM* Lobelius, Obs. p. 97, (1576).

*Erythronium* Linn., Syst. (1735); Hort. Cliff. p. 19, (1737); Gen. Pl. p. 92, (1737); p. 142, (1742); p. 145, (1754); Sp. Pl. p. 305, (1753). *Dentali* Clusius Hist. Stirp. Pannon. p. 228, (1583); *Dens canis* Tour. Els. Bot. p. 301, (1694); I. R. H. p. 378, (1700); *Mithridatum* Adans. Fam. p. 48, (1763).

*Erythronium albidum* Nutt. Gen. 1, p. 223, (1818).

Lake Maxinkuckee (Clarke). I have found the plant at Notre Dame, along the St. Joseph River in low woodland. The specimens are not abundant and are fast disappearing so that it can be considered as quite rare.

*Erythronium americanum* Ker. Bot. Mag. pl. 1113, (June, 1808).

*Erythronium augustatum* Raf. Med. Rep. 2, 5, p. 354, (July 1808).

Notre Dame, Ind.; Navarre Place; U. N. D. Herb., No. 1915; Mud Lake, 7 miles N. of Lydick, Ind.; [St. Joseph Co.] No. 807;

Studebaker's Woods, South Bend, No. 9426; Munich, Mich., [Berrien Co.], No. 9216. I have found the plant in all the counties without collecting or out of the season of flower or fruit. At Munich, Mich., specimens with black anthers and stamens were growing together with others having yellow ones. No other notable differences were observed in the plants. No. 11010 Lapaz Junction.

Subfamily SCILLEAE Reichenb. Consp. p. 65, (1828) in *Ornithogaleae* Salisb. l. c.

*ORNITHOGALUM* Nicander, Dioscorides.

*Ornithogalum* Linn., Syst. (1735); Hort. Cliff. p. 124, (1737); Gen. Pl. p. 95, (1737); p. 145, (1742); p. 145, (1754); Tour. Els. Bot. p. 301, (1694); I. R. H., p. 378, (1700); *Stellaris* Dillen, Gen. 110. *Celsia* Heister, Syst. p. 86, also Syst. p. 5, (1748).

*Ornithogalum umbellatum* Linn. Sp. Pl., 307, (1753).

Escaped at Notre Dame, Ind., also St. Joseph, Mich.

*MUSCARI* Clusius, Pannon, p. 202, (1583).

*Muscari* P. Miller, Gard. Dict., ed. 7, (1759); *Botryphile* Salisb. Gen. Pl., p. 25, (1866); *Botryanthus* Kunth, Enum., Pl., 4, p. 310, (1843) as a segregate.

*Muscari botryoides* (Clusius) Miller. Gard. Dic. ed. 8, (1768)

*Hyacinthus botryoides* Clusius l. c. p. 204, (1583); also Linn., Sp. Pl. p. 318, (1753).

Escaped at Notre Dame. It does not spread as readily as the following. Bertrand [Berrien Co.], Mich.

*Muscari racemosum* (Linn.) Miller l. c. *Hyacinthus racemosus* Linn. l. c.

Very well established in a sandy field N. W. of St. Mary's, Notre Dame, and spreading along a road very fast. No. 11034.

Subfamily. ALETROIDEAE. Engler and Prantl. Pflanz. Fam. 2, 5, p. 85, (1886).

*ALETTRIS* Linn., Nov. Gen. Pl. p. 15, (1751); Gen. Pl. p. 149, (1754); Sp. Pl. p. 319, (1753); also *Alethris* Amoen. Acad. III., p. 11, (1756).

*Aletris farinosa* Linn. l. c., also Amoen. Acad. l. c.

[St. Joseph Co.] Barnes; [Lake Co.] Blatchley also Deam; St. Joseph Co. and Elkhart Co.; U. N. D. Herb., No. 73; Dune Park [Lake Co.] No. 9745.

Subfamily. **HEMEROCALLIDEAE** Bart. l. c. p. 50.

*Hemerocallideae* Dum. Com. Bot. p. 66, (1823).

**HEMEROCALLIS** Dioscorides.

*Cynorrodium* or *Cannarhodium* Gesner. Hort. Germ. p. 245, (1561); *Hemerocallis* Linn., Syst. (1735); Hort. Cliff. p. 128, (1737); Gen. Pl. p. 98, (1737); p. 148, (1742); p. 151, (1754); Sp. Pl. p. 324, (1753), *Liliasphodelus* Tour. Els. Bot. p. 279, (1694). *Lilio-Asphodelus* Tour. I. R. H. p. 299, (1700); also *Liliasphodelus* Clusius Hist. St. Pannon., p. 143, (1583). *Cameraria* Boehmer: Ludw. Def. Pl. Gen. Pl. p. 56, (1760).

**Hemerocallis fulva** Linn. Sp. Pl. ed. 2, p. 462, (1762); *Hemerocallis Lilio-Asphodelus fulvus* Linn. Sp. Pl. p. 324, (1753).

Extensively escaped from gardens. Considered quite a weed. Notre Dame, South Bend, Michigan City [Laporte Co], St. Joseph and Benton Harbor.

Family 32. **BACCIFERAE** Haller, Fl. Helv. 2, p. 116, (1768).

*Asparagi* Jussieu Gen. Pl. p. 40, (1789). *Asparagineae* Dumortier Fl. Belg. St. p. 138, (1827), also Com. Bot. p. 66, (1823). *Convallariaceae* Link, Handb. I. p. 184, (1829).

Subfamily **ASPARAGOIDEAE** Vent. Tabl. 2, p. 141, (1799).

*Asparageae* D. C. in Lam. and D. C. Fl. Fr. ed. 3, 3, p. 172, (1805); also Dum. l. c.

**ASPARAGUS** Dioscorides 2. 151; Juvenal, Sat. 5, 82; 9, 69. Theophrastus, Pliny, 19, 8 and 42; *Asparagus* of the Pre-Linnaean authors: Fuchs, (1543); Cordus and Gesner, (1561), etc., etc. Also Tour. Els. Bot. p. 249, (1694); I. R. H. p. 300, (1700); Linn., Syst. (1735); Hort. Cliff. p. 121, (1737); Gen. Pl. p. 93, (1737); p. 145, (1742); p. 145, (1754); Sp. Pl. p. 313, (1753).

**Asparagus hortensis** Marcellus Vergilius, in Dios. Com. p. 260, (1529). *Camerarius*, Hort. Med. Phil. p. 23, (1588). *Dodonaeus* Pempt. 5, 4, 13, (1583).

*Asparagus altilis* Hermolaus Barbarus, Cor. p. 38, (1530). Fuchs. Stirp. Hist. p. 20, (1546); p. 34, (1549); Ruellius, Dios. Mat. Med. p. 173, (1547); Matthioli, Com. Diosc. p. 280, (1559); p. 251, (1554). *Asparagus petraeus* Galen VI. (?). *Asparagus domesticus* Hort. Syst. Bellonius, *Asparagus domesticus vulgaris* Lobelius, Obs. p. 458, (1576). *Asparagus holeraceus* Tabernaemont-

tanus Kreüterbuch, p. 399, (1625), also Anguillara (1561). *Asparagus sativus* Gesner, 1561, *Asparagus sativa* C. Bauhin, Pinax p. 488, (1623); Tour. Els. Bot. l. c.; I. R. H. l. c.; Morandi. Hist. p. 105, (1761). *Asparagus scanensis* Linn. Pan Suecus, Am. Acad. I, p. 245, (1751). *ASPARAGUS OFFICINALIS* Linn. Sp. Pl. p. 313, (1753). *Asparagus esculentus* Salisb. Pr. 252, No. 2, (1796).

Escaped from gardens everywhere in the region. I have found it in all the counties. No. 2971, N. U. D. Herb., Notre Dame.

Subfamily MAIANTHEMEAE Dum. Fam. des Pl. p. 60, (1829).

*VAGNERA* Adanson Fam. des Pl. 2, p. 496, (1763). *Smilacina* Desf. Ann. Mus. Paris, 9. p. 51, (1807); *Tovaria* Necker, El. Bot. 3, p. 146, (1790); not *Tovara* Adans (1763); *Sigillaria* Raf., Jr. Phys. 89, p. 261, (1809); *Polygonastrum* Moench, Meth., p. 637, (1794); *Neolexis* Salisb., Gen. Pl. p. 64, (1866).

*Vagnera racemosa* (Linn.) Morong, Mem. Torr. Bot. Cl. 5, p. 114, (1894).

*Smilacina racemosa* Desf. l. c.; *Convallaria racemosa* Linn., Sp. Pl. p. 315, (1753); *Polygonastrum racemosum* Moench, l. c.

Lake Maxinkuckee (Clarke); U. N. D. Herb., Nos. 1956 bis. 2964 from Notre Dame. Common in all the counties. The inflorescence is sometimes laterally flat branching only on opposite sides of the rachis. No. 11211 Notre Dame.

*ASTERANTHEMUM* Kunth, Enum. Pl. V., p. 151, (1850).

*Vagnera* Adans. l. c. segregate.

*Asteranthemum stellatum* (Linn.)..

*Asteranthemum vulgare* (Linn.) Kunth l. c. p. 152.

*Majanthemum stellatum* Link. Enum. 1, p. 343.

*Vagnera stellata* (Linn.) Morong. l. c.

[Lake Co.] (Hill); [Laporte Co.] (Deam); I have found it everywhere in the range. St. Joseph, Mich. 11025, 11070.

*Asteranthemum trifolium* (Linn.).

*Convallaria trifolia* Linn., Sp. Pl. p. 316, (1753); *Smilacina trifolia* (Linn.) Desf. l. c. p. 52. *Vagnera trifolia* (Linn.) Morong. l. c.

Pine, Berry Lake, Higley and Raddin. Gibson, Ind. (Babcock), [Lake Co.].

*UNIFOLIUM* Brunsvigius, (1500), alos *Tragus* Stirp. Hist. (1552), Chabraeus (1671), Dodonaeus Pempt. p. 20, (1583), Zinn.,

Cat. Pl. Gott. p. 104, (1757), Ludwig Boehmer, Def. Gen. Pl. p. 215, (1760), Adanson Fam. Pl., p. 54, (1763).

*Monophyllon* Ray, Hist. p. 668, (1686). *Smilax* Tour. I. R. H. p. 654, (1700); *Maianthemum* Web. Prim. Fl. Holsat. p. 14, (1780) not *Maianthemum* Ludwig 1737 = *Unifolium*. *Styrandra* Raf. Amer. Month. Mag. p. 266, (1818); *Maia*, Salisb. Gen. Pl. p. 64, (1866); *Bifolium* Gaertner, Mag. and Scherb. Fl. Wetterau 1, p. 209, (1799). *Sciophylla* Heller, Fl. Wirceb. p. 158, (1810), *Sciophylla* Wibel Pr. Fl. Werth, p. 147, (1799); *Valentinia* Heister Fab. Enum. Fl. Hort. Helm. p. 37, (1763), *Evallaria* Necker, El. 3, p. 189, (1790) in part.

*Unifolium canadense* (Desf.) Greene, Bull. Torr. Bot. Cl., 15, p. 287, (1898).

*Maianthemum canadense* Desf. Am. Mus. Paris, 9, p. 54, (1707); *Smilacina bifolia* var *canadensis* A. Gray, Man. ed. 2, p. 467, (1856).

[Lake Co.] (Hill and Blatchley); [Laporte Co.] (Deam); Mineral Springs [Porter Co.] (Deam); Lake Maxinkuckee (Clarke). I have found it in every county except Elkhart. [Porter Co.], U. N. D. Herb. Nos. 937, 9537, 10021, St. Joseph, Mich., 6066; Millers, Ind., 2640; Smith, Ind., [Laporte Co.] 9238; Mishawaka, Ind. 9214.

Subfamily. POLYGONATEAE Benth. and Hook. Gen. III., p. 752, (1883).

*POLYGONATUM* Dioscorides, 4, 6 and of nearly all the pre-Linnaean writers, also Tour. Els. p. 69, (1894); I. R. H. p. 78, (1700); Hill, Br. Herbal. p. 320, (1756); Morandi, Hist. Bot. Pract. p. 105, (1761); Zinn. Cat. Pl. Gott. p. 103, (1757); Ludwig-Boehmer l. c. p. 59, (1760); Adanson l. c. p. 541, (1763).

*Salomonina* Heister, Syst. 5, (1748); Fabricius, Enum. Pl. Hort. Helm. p. 38, (1763); *Campeyodorum* Salisb. Gen. Pl. p. 64, (1866).

*Polygonatum biflorum* (Walt.) Ell. Bot. S. Car. and Ga., p. 393, (1817).

*Convallaria biflora* Walt. Fl. Car. p. 122, (1788). *Salomonina biflora* (Walt.) Britton Man. p. 273, (1901).

Lake Maxinkuckee (Clarke). I have found it throughout the range. U. N. D. Herb. Nos. 834, 11210; N. Liberty, Ind. No. 9227; Birchim, Ind. [Laporte Co.; No. 11035 Lapaz Junction.



*Polygonatum commutatum* (R. and S.) Dietr. Gartenz. 3, p. 223, (1835.)

*Polygonatum giganteum* Dietr. l. c. p. 328. *Convallaria commutata* R. and S. Syst. 7, p. 1671, (1830) *Salomonina commutata* (R. and S.) Britton l. c. No. 11212 Notre Dame, also 11213.

Lake Maxinkuckee (Clarke). I have found this plant also throughout the range.

Subfamily CONVALLARIEAE Dum. Am. Fam.

CONVALLARIA Linn. Syst. (1735); Hort. Cliff. p. 124, (1737); Gen. Pl. p. 96, (1737); p. 146, (1742); p. 148, (1754); Sp. Pl. p. 314, (1753).

*Callionymus*<sup>3</sup> Gesner. Hort. Germ. (1561) *Liliago* Vaillant. Fl. Par. p. 70, (1723); p. 116, (1727) not *Liliago* Caesalpinus (1583) = *Anthericum* Sp. nor *Liliago Cordus* (1561) = *Phalangium* sp. *Lilium Convallium* Tour. Els. Bot. p. 68, (1694), I. R. H. p. 77, (7100); Moench. Meth. p. 636, (1794); Morandi, Hist. p. 105, (1761); *Convallium* Ludwig, De Min. Pl. Gen. p. 7, (1737); Kramer, Tent. Bot. p. 3, (1744); *Maianthemum* Ludwig De Min. Pl. et. (1737)

*Convallaria majalis* Linn. Sp. Pl. l. c.

*Convallaria Lilium Convallium* Linn. Pan Suecus. in Am. Acad. II. p. 245, (1748). *Lilium Convallium majalis* Moench. l. c. *Lilium Convallium album* Morandi l. c.

The reason for referring to this usually only cultivated plant is that a sheet, in U. N. D. Herb. No. 2978 collected by Powers at Notre Dame, notes it as "escaped from cultivation, old Botanical Garden" in 1889. I have not found it in wild state.

Family 33. TRILLIACEAE De Candolle Ess. Med.

p. 294, (1816).

*Parideae* Dum. Fl. Belg. St. p. 139, (1827), also Kunth, (1850); Link. Handb. 1, p. 297, (1829); Bartl. Ord. p. 53, (1830) [Div. of *Smilacaceae*]: *Melaniojæ* Dum. Com. Bot. p. 65, (1823).

MEDEOLA Linn. Syst. (1735); Gen. Pl. p. 107, (1737); p.

<sup>3</sup> Beside the fact that *Callionymus* is used and accepted for the name of an animal, Gesner uses it moreover only as a synonym for the appellation *Lilium Convallium* as used for this plant. Both *Convallium* and *Maianthemum* are antedated by *Convallaria*. We see, therefore, no reason to accept *Callionymus*.

154, (1742); p. 158, (1754); Sp. Pl. p. 339, (1753); Gronovius Fl. Virg. p. 39, (1739).

**Medeola virginica** Linn. l. c.

[Lake Co.] S. Coulter,; Miller's, Ind. (Hill); Edgemoor (Johnson) [Lake Co.]; Berry Lake, Ind. Gibson (Babcock); Lake Maxinkuckee (Clarke); U. N. D. Herb. Nos. 9076, 947, 10100, 702, 947, 2762; Mineral Springs [Porter Co.]. I have found the plant also at Benton Harbor and St. Joseph [Berrien Co.], Mich., Bankson Lake [Van Buren Co.], Mich.; [Marshall Co.]; N. Liberty [St. Joseph Co.]. Specimen number 702 gathered at Mineral Springs in Sept. 22, 1910 shows the lower part of the leaves in the upper whorl when the fruit formed, changing to a deep carmine to purple towards the end of ripening. I noticed this in case of all the plants there at the time.

**TRILLIUM** Linn., Sp. Pl. p. 339, (1753); Gen. Pl. p. 158, (1754).

**Trillium grandiflorum** (Michx.) Salisb. Par. Lond. 1 p. (1805).

*Trillium rhomboideum* var. *grandiflorum* (Michx.) Fl. Bor. Am. 1, 216, (1803).

[Laporte Co.] (Deam). The most common of the group. I have found it in all the counties. U. N. D. Herb. No. 2670½; Sagunay [Laporte Co.] Nos. 417, 9425, 2494, 2525, 6077; Notre Dame; 431, South Bend, Ind; also Nos. 3255, 3256, Notre Dame Ind., collected by Powers. No. 2712 Stephenville, Mich. [Berrien Co.]; Lapaz Junction [Marshall Co.] Nos. 11107, 11012.

**Trillium cernuum** Linn. Sp. Pl. 339, (1753).

Studebaker's Woods, South Bend, U. N. D. Herb. No. 1843.

**Trillium erectum** Linn. Sp. Pl. p. 340, (1753). U. N. D. Herb. No. 2670 Sagunay [Laporte Co.]; No. 432 South Bend, Ind. 10162 South Bend; also 11062, 11153.

**PHYLLANTHERUM** Raf., Jr. de Phys. 89, p. 72.

*Esdra* Salisb., Gen. Pl. p. 60, (1866).

**Phyllanthum sessile** (Linn.).

*Trillium sessile* Linn. l. c.

U. N. D. Herb., Notre Dame, Ind., Nos. 428, 1837, 2550. I have found it also at Lapaz Junction [Marshall Co.] No. 11013; North Liberty and Lakeville [St. Joseph Co.] No. 11015.

**Phyllanthum recurvatum** (Beck).

*Trillium recurvatum* Beck, A. Jr. Sci. 2, p. 178, (1826).

More common than the preceding, often growing with it. Lake Maxinkuckee, (Clarke); Nos. 429, 1952, 1893, 814 U. N. D. Herb., Notre Dame, Ind. The last has the parts of the flower in 4's. Nos. 1996, 3254, Notre Dame collected by Powers. No. 7410 Notre Dame collected by W. Johnson. The plant has been found throughout the region and is by far the commonest of all. A plant with the parts in 4's was also collected by me near Lapaz Junction.

Family 34. **SMILACEAE** Ventenat. Tab. Reg. Veg. p. 146, (1799); also R. Brown. Prodr., p. 299, (1810); Dumortier, Com. Bot. p. 67, (1823); Bartling, Ord. Nat. Pl. p. 52, (1830); Lindley, Int. Nat. Syst. p. 277, (1830); Nat. Syst. ed. 2, p. 359, (1836).

**NEMEXIA** Rafinesque, Neogenyton, p. 3, (1825).

*Smilax* Linn., Sp. Pl. p. 1028 (in part). *Coprosmanthus* Kunth, Enum. 5, p. 263, (1850).

**Nemexia pulverulenta** (Michx.) Small, Fl. SE. U. S., p. 281, (1903).

*Smilax pulverulenta* Michx. Fl. Bor. Am. 2, p. 238, (1803).

Lake Maxinkuckee (Clarke); [Laporte Co.] Deam); [Marshall Co.] (Deam); Nos. 9275, 9710, 1858, 9313, 2987, Notre Dame, Ind. (The last collected by W. Johnson). No. 9345 Birchim, Ind. [Laporte Co.]; No. 11214 Notre Dame.

**Nemexia ecirrhatta** (Engelm.) Small l. c. p. 280.

*Smilax ecirrhatta* S. Watson. Gray's Man. Ed. 6, p. 520, (1890). *Coprosmanthus herbaceus* var. *ecirrhattus* Kunth, Enum. 5, p. 266, (1850).

N. D. U. Herb. Nos. 1993, 1854 Notre Dame, Ind. (Powers); No. 9223 Birchim, Ind. [Laporte Co.]; No. 9518 Notre Dame, Ind.

**SMILAX** Dioscorides 4, 142, Theophrastus, 1, 10; 3, 18; Pliny 16, 35, and of the older authors with scarcely any exception. *Smilax* Tour. Els. Bot. p. 512, (1694); I. R. H. p. 654, (1700); Linn. Syst., (1835); Hort. Cliff. p. 458, (1737); Gen. Pl. p. 305, (1737); p. 428, (1742); p. 455, (1754); Sp. Pl. p. 1028, (1753).

**Smilax rotundifolia** Linn. Sp. Pl. p. 1030, (1753).

*Smilax caduca* Linn. l. c. *Smilax quadrangularis* Willd. Sp. Pl. 4, p. 775, (1806).

Lake Maxinkuckee (Clarke); [Laporte Co.] (Deam); Michigan City [Laporte Co.]; [Lake, Berrien, Van Buren, Porter Co.s]. Lakeville, Ind. [St. Joseph Co.]; U. N. D. Herb. No. 9126; Notre Dame, Ind. Nos. 897, 11215.

*Smilax hispida* Muhl. Torr. Fl. N. Y. 2, p. 302, (1843).

Lake Maxinkuckee (Clarke). Edgemoor, Johnson. I have found it in all the counties.

*Smilax glauca* Walt. Fl. Car. p. 245, (1788).

*Smilax spinulosa* J. E. Smith, Torr. Fl. N. Y. 2, p. 303, (1843).

Whiting (Hermann Jaeger) acc. to Cat. of Higley and Raddin.

Family 35. **HYPOXIDEAE** R. Brown. Fl. Voy. p. 277, (1814); also Vermischte. ed. Nees. (1825). Dumortier, Am. Fam. p. 58, (1839) Bartling, Ord. Nat. p. 42, (1830).

*HYPOXIS* Linn., Systeman, Ed. 10, 2. p. 986, (1759).

*Hypoxis hirsuta* (Linn.) Coville, Mem. Torr. Cl. 5, p. 118, (1894).

*Hypoxis erecta* Linn. ed. 10 l. c. *Ornithogalum hirsutum* Linn., Sp. Pl. p. 306, (1753). I have found this plant in Laporte and Berrien counties. No. 3202 Notre Dame (Powers).

### Order 13. ENSATAE.

Bartling Nat. Ord. p. 40, (1830).

Family 35. **DIOSCORINEAE** Dumortier, Com. Bot. p. 66, *Dioscorideae* Dum. An. Fam. Pl. p. 59, (1829); *Dioscoreae* R. Brown, Prod. 294, (1810); Lindley, Nat. Syst. (1830); Agardh, Aphor. p. 169, (1823); Achar. Rich. Novob. El. p. 434, (1828); *Dioscoreaceae* Lindley Nat. Syst. Ed. 2, p. 359, (1836).

*DIOSCOREA* Plumier, Nov. Pl. Am. Gen. p. 9, (1703). *Ricophora* Plukenett. Almag. p. 321, (1696); also P. Miller, Gard. Dict. Ed. 6, p. 175, App. (1750); *Dioscorea* Linn., Hort. Cliff. p. 459,; Gen. Pl. p. 306, (1737); p. 478, (1742); p. 456, (1754); Sp. Pl. p. 1032, (1753).

*Dioscorea paniculata* Michx., Fl. Bor. Am. 2, p. 238, (1803).

*Dioscorea villosa* Linn. l. c. (?) *Dioscorea villosa* of the American authors in part.

Lake Maxinkuckee (Clarke); Berry Lake, Millers, Higley

and Raddin. I have found it in all the counties. Nos. 9348, 1059, U. N. D. Herb., Notre Dame, Ind.

Family 36. **IRIDEAE** Ventenat, Tab. Reg. Veg. p. 188.

*Iridaceae* Lindley, Nat. Syst., ed. 2, p. 382, (1836).

*IRIS* Theophrastus, 9:7, Dioscorides, 1:1,4:32, Pliny and nearly all pre-Linnaean writers<sup>4</sup>.

*Iris* Tour. Bot., p. 291, (1694); I. R. H. p. 358, also including *Xiphion* and *Sisyrinchium* of the same author.

*Iris versicolor* Linn., Sp. Pl. p. 38, (1753).

*Iris virginica* Linn.l. c.

Lake Maxinkuckee (Clarke). Found throughout the region. U. N. D. Herb. No. 3228, Notre Dame, Ind., (Powers); No. 2664, Notre Dame; 544 Chain Lakes. No. 2681 a first thought to be only an albino<sup>5</sup> showed on more careful examination other more notable differences, some of these, however, already referred to. The flowering peduncle is scarcely half as thick as the ordinary plants. The leaves much narrower, and very long, averaging nearly twice those of other plants. The joint of the leaf on the flowering stalk is not swollen. The involucral bracts become narrowed gradually upwards instead of being broadest in the middle; they are long attenuate. The flower beside being perfectly white, without the characteristic purple or violet lines that albinos of blue flowers usually exhibit, is only a little more than one half as large. The stigma about one half as large. The habit of the plant too is strikingly different being as tall, but strict. The root leaves withered are even correspondingly more narrow, and very short. Root-stock thin. The plant seems a good variety which we may call *Iris versicolor* var. *blandescens* Nwd. nov. var.

*BERMUDIANA* Tour. Els. Bot. p. 306, (1694); I. R. H. p. 387, (1700); Dillenius. Hort. Eltham. p. 48, (1732); also *Bermudiana* Linn., Syst. (1735); *SISYRINCHIUM* Linn., Gen. P. p. 273, (1737); p. 436, (1742); p. 409, (1754); Sp. Pl. p. 954, (1753), not *Sisyrinchium* Tour, and of the older authors = *Iris*; *Bermudiana* Adans. Fam. II., p. 60, (1763).

*Bermudiana angustifolia* (Mill.)

<sup>4</sup> Name of some species also written *Xyris*, e. g. Pliny 21:22.

<sup>5</sup> Am. Mid. Nat. Vol. II., p. 266.

*Sisyrinchium angustifolium* Miller. Gard. Dict. ed. 7, (1759).  
Lake Maxinkuckee, (Clarke). Nos. 11055 South Bend; 11117,  
Notre Dame, Ind. (Not common).

***Bermudiana campestris* (Bicknell).**

*Sisyrinchium campestre* Bicknell. Brittons Fl. N. States and  
Canada, p. 286, (1901).

U. N. D. Herb. No. 11033 South Bend, Ind.; Nos. 3231,  
590, 2062, 11084 Notre Dame, Ind.; No. 9697 Dune Park [Lake  
Co.]; No. 11006 Lydick [St. Joseph Co.]; No. 11016 Chain Lakes  
[St. Joseph Co.]; Nos. 11020, 11041 Webster's Crossing, N. of  
Notre Dame, Ind.; No. 479 Big Four R. R. near Edwardsburg,  
Mich. [Berrien Co. (Rather common.)

***Bermudiana graminea* (Curtis).**

*Sisyrinchium gramineum* de Lamarck, Encyc. 1, 458, (1787);  
Curtis Bot. Mag. t. 464, (1799).

*Sisyrinchium graminoides* Bicknell in Britton's Fl. 1. c.

U. N. D. Herb. No. 9748½, Dune Park, Ind. [Lake Co.];  
No. 495 Edwardsburg, Mich. [Berrien Co.]; Nos. 2719, 2729,  
2711 Stephenville, Mich. [Berrien Co.]; Nos. 2760, 498 (2), 597,  
Notre Dame, Ind.; Michigan City [Laporte Co.], (C. D. Mell.);  
Millers and Pine, Ind. [Lake Co.] (Umbach); Edgemoor Johnson.

***Bermudiana apiculata* (Bicknell).**

*Sisyrinchium apiculatum* Bicknell, l. c.

No. 26, 4201, 11200 (3), 11201, Websters Crossing, N. of  
Notre Dame, also 26a with white flowers; No. 3232 Notre Dame,  
Ind.; Nos. 51, 9189 near Granger, Ind. [St. Joseph Co.] on the  
Elkhart Co. boundary. The specimens in our region have also  
decidedly pyriform capsules, some at times ovoid instead of  
subglobose. The spathes are longer at times almost equalling  
the flowers.

***Bermudiana apiculata* var. *mesochora* Nwd. nov. var.**

*SISYRINCHIUM APICULATUM* var. *MESOCHORUM* Nwd.

Type No. 11202 (2) U. N. D. Herbarium, collected at Webster's  
Crossing, north of Notre Dame, Ind. Resembling the preceding  
but a smaller plant, 13 cm.-38 cm. Stems 1.5-2 mm. wide about  
twice as long as the leaves. Flowers dark violet drying purplish.  
Spathes long acuminate Capsules subglobose 4-6 mm. long.

## Order 14. SYNANDRAE.

Agardh. Aphor. p. 179, (1823).

*Orchidales* Britton Manual p. 288, (1901).

Family 36. ORCHIDEAE Haller, Enum. St. Helvet. 1, p. 262, (1742). Prag. 33. Linnaeus, Phil. Bot. p. 27, (1751); Haller Cat. Pl. Gott. p. 61, (1753); R. Brown, Prod. 309, (1810).

*Orchidaceae* Lindley. Nat. Syst. ed. 2, p. 336, (1836).

Subfamily CYPRIPEIDIEAE Lindley Orchid., Sal. p. 7-18, (1826). ex Dum. An. Fam. Pl. p. 57, (1829); Fl. Belg. (1827).

*CALCEOLUS* (Rivinus)<sup>6</sup> Tournefort, Els. Bot. p. 345, (1694); also I. R. R. p. 436, (1700); *Calceolus* Zinn. Cat. p. 85, (1757); Adanson, Fam. II., p. 70, (1763); *Calceolaria* Heister, Syst. p. 5, (1748); CYPRIPEIDIUM Linn., Syst. (1735); Gen. Pl. p. 272, (1737); p. 435, (1742); p. 408, (1754); Sp. Pl. p. 951, (1753).

*Calceolus Reginae* (Walt.).

CYPRIPEIDIUM REGINAE Walt. Fl. Car. p. 222, (1788).

*Cypripedium album* Ait., Hort. Kew. 3, 303, (1789); *Cypripedium spectabile* Salisb., Trans. Linn. soo. p. 78, (1791).

[Lake and Porter Co.'s] (Bradner); [Marshall Co.] (Hessler); Calumet, Ind. (Higley and Raddin); Pine, Ind. (Bastin). Flowers with regular perianth. U. N. D. Herb. No. 2772, near Woodland on Turkey Creek road (St. Joseph Co.); Nos. 3304, 2330 near Bankson Lake [Van Buren Co.]; No. 891, Mineral Springs [Porter Co.].

*Calceolus candidus* (Willd.).

CYPRIPEIDIUM CANDIDUM Willd. Sp. Pl. 4, p. 142, (1805).

Pine, Ind. (Umbach); U. N. D. Herb. No. 10115 (2), Mineral

<sup>6</sup> The *Calceolus Mariae* of some of the older authors meaning *Cypripedium Calceolus* Linn. may have been used as a generico-specific binary name, e. g. Dodonaeus, 2:1:22; (1588); Lobelius Obs. p. 161, (1576). Hence the genus is referred to Tournefort. The name *Calceolus Mariae* Mary's Slipper, Our Lady's Slipper was changed by Linnaeus to *Cypripedium*, meaning Venus' Slipper. By another unfortunate circumstance the segregate *Fissipes* Small, means *cloven foot*. It is scarcely possible that the genus were dedicated to his satanic majesty, but rather named because the flower of the plant has the inflated sac like petal cleft in front. The name, however, might certainly with more adavance to previous circumstances have been better chosen.



Springs. Arbor-Vitae-Tamarack bog in the dune region, growing with the preceding and the Stemless Lady's Slipper. Nos. 1948, 2033, 3203, collected near St. Joseph's Lake, Notre Dame; the former by Kiesgen the others by Powers. I have seen the plant in great abundance around the lakes at Notre Dame. The plants have disappeared since then due to the fact that when the lakes were dredged the marl was thrown upon them. Very common on the Grand Trunk R. R. between South Bend and Crumstown.

**Calceolus hirsutus** (Miller).

*Cypripedium hirsutum* P. Miller, Gard. Dict. Ed. 8, No. 3, (1763); *Cypripedium pubescens* Willd. Sp. Pl. 4, p. 143, (1803). Clarke, Ind. (Umbach). Notre Dame, Ind.

**Calceolus parviflorus** (Salisb.).

*Cypripedium parviflorum* Salisb. Trans. Linn. Soc. 1, p. 77, (1791).

[Lake Co.] Blatchley); Notre Dame, Ind. No. 2032 (Powers). The plant is now becoming scarce, though in certain years it reappears in meagre abundance around the University.

**FISSIPES** Small. Fl. SE. U. S. p. , (1903).

*Cypripedium* Ait. Hort. Kew. 3, p. 303, (1789) in part.

**Fissipes acaulis** (Ait.) Small l. c.

*Cypripedium acaule* Ait. l. c.

U. N. D. Herb. No. 754, Sagunay [Laporte Co.]; No. 2772, Tamarack swamps on Turkey Creek Road [St. Joseph Co.]; No. 10109, Mineral Springs [Porter Co.].

Subfamily OPHRYDEAE Lindley, Orchid. Scel. p. 96, [(1826).

**GALEARIS** Raf., Fl. Tell. pt. 2, p. 39, (1836), not *Galearia* Heister, nor *Galearia* Presl. Symb. Bot. 1, p. 49, (1830); *Galeorchis*<sup>7</sup>

<sup>7</sup> The name *Galeorchis* is a hybrid etymologically composed of the Greek *orchis*, and Latin *galea*. *Cranorchis* would have been more correct and according to usage of good grammar. There should be some law, if it is worth while making nomenclatorial laws for congresses which condemns unfit names. The sanction thereof ought so to work as to render names invalid *post factum*. We prefer the older name *Galearis* in spite of its close relationship to *Galearia* in derivation not sound, and sound is in fact the thing that makes a name different; for the name is the spoken word and not a twist in spelling. *Wuffia*, *Wolfia*, and *Wolifia* are nearer alike than the two words in question of four and five syllables, *Galearis* and *Galearia*.

Rydb. Britton's Man. Fl. N. St. p. 292, (1901).

*Orchis* Linn., Sp. Pl. p. 939, (1753) segregate.

*Galearis spectabilis* Raf. l. c.

*Galeorchis spectabilis* (Linn.) Rydberg l. c.

*Orchis spectabilis* Linn. p. 743, l. c.

U. N. D. Herb. No. 2484, South of Mishawaka, Ind. [St. Joseph Co.]; collected also by me at Munich, Mich. [Berrien Co.].  
Very rare!

*LYSIAS* Salisb., Trans. Hort. Soc. 1; p. 228, (1812).

*Habenaria* Willdenow, Sp. Pl. 4, p. 44, (1895; *Platanthera* Richard. Mem. Mus. Paris 4, p. 481, (1818).

*Lysias hookeriana* (A. Gray), Rydb. Britton's Man. p. 294, (1905).

*Habenaria hookeriana* A. Gray Ann. Lyc. N. Y. 3, p. 229, (1836); *Habenaria Hookeri* var. *oblongifolia* Paine, Cat. Pl. Oneida, p. 83, (1865); *Habenaria orbiculata* Goldie. Edinb. Phil. Jr. 6, p. 331, (1822); not *H. orbiculata* Pursh. Fl. Am. Sept. p. 588, (1814).  
[Lake Co.] (Hill); Millers, (Babcock) Edgemoor. (Hill).

*LIMNORCHIS* Rydberg. Mem. N. Y. Bot. Gard. 1, o. 105, (1900).

*Habenaria* Willd. l. c. segregate.

*Limnorchis hyperborea* Rydb. l. c.

*Habenaria hyperborea* (Linn.) R. Br. Ait. Hort. Kew. ed. 2:5, p. 193, (1813); *Orchis hyperborea* Linn. Mant. p. 121, (1767).

Miller's (Umbach); [Porter Co.] S. Coulter, Pine (Hill); Sagunay [Laporte Co.], No. 9514. No. 39 U. N. D. Herb.; Big Four Railroad, Granger, Ind. [St. Joseph Co.]; No. 9362, Notre Dame, Ind.

*Limnorchis dilatata* (Pursh.) Rydb. l. c.

*Habenaria dilatata* (Pursh.) Hooker, Exot. Fl. 2, p. 95, (1825)  
*Orchis dilatata* Pursh. Fl. Am. Sept. p. 588, (1814).

Millers (Umbach).

*BLEPHARIGLOTTIS* Raf. Fl. Tell. II, p. 38, (1836).

*Habenaria* Willd., l. c. segregate.

*Blephariglottis ciliaris* (Linn.) Rydb. Britton's Man. Fl. N. S. p. 296, (1901).

*Habenaria ciliaris* (Linn.) R. Br. l. c. p. 194; *Orchis ciliaris* Linn., Sp. Pl. p. 939, (1753).

Millers (Umbach); [St. Joseph Co.] (Barnes); Lake Maxinkuckee (Clarke).

***Blephariglottis lacera*** (Michx.) Rydb. l. c.

*Habenaria lacera* (Michx.) R. Br. Prod. Fl. Nov. Hall. 1, p. 312, (1810); *Orchis lacera* (Michx.) Fl. Bor. Am. 2, p. 156, (1803).

Casella, (Higley and Raddin); Calumet (Babcock); Millers (Hill, Bastin); Normal (Brennan); Lake Maxinkuckee (Clarke); No. 9515 U. N. D. Herb. Sagunay [Laporte Co.]; No. 2695, Lake at Studebaker's Woods [St. Joseph Co.]; No. 40, Big Four Railroad between Granger and Elkhart [Elkhart Co.].

***Blephariglottis laucophaea*** (Nutt.) Rydb. l. c.

*Habenaria leucophaea* Nutt. A. Gray Man. Ed. 5, p. 502, (1867); *Orchis leucophaea* Nutt. Trans. Am. Phil. Soc. II., 5, p. 161, (1833-37 Lake Maxinkuckee (Clarke); Bankson Lake, Mich. [Van Buren Co.]; No. 11203 U. N. D. Herb.

***Blephariglottis alba*** (Michx.).

*Blephariglottis blephariglottis* (Michx.) Rydb., l. c.

*Habenaria blephariglottis* Torrey. Comp. 317, (1826); *Orchis ciliaris* var. *alba* Michx. Fl. Bor. Am. 2: p. 157, (1803). Not *Orchis alba* Lam., (1778); *Orchis blephariglottis* Willd. Sp. Pl., 4: p. 9, (1805); *Habenaria ciliaris* var. *alba* Morong. Bull. Torr. Club, 20, p. 38, (1893).

Lake Maxinkuckee (Clarke).

***Blephariglottis psycodes*** (Linn.) Rydb. l. c.

*Habenaria psycodes* (Linn.) A. Gray, Am. Jr. Sc. 38, p. 310, (1840); *Orchis psycodes* Linn., Sp. Pl. p. 943, (1753); *Orchis fimbriata* Ait. Hort. Kew. 3, p. 297, (1789).

Millers, Ind. (Hill and Bastin).

***GYMNADENIOPSIS*** Rydb. l. c. p. 293.

*Habenaria* (Willd.), segregate.

***Gymnadeniopsis clavellata*** (Michx.) Rydb. l. c. \*

*Habenaria clavellata* Michx., Fl. Bor. Am. 2, p. 155, (1803); *Orchis tridentata* Willd., Sp. Pl. 4, p. 41, (1805); *Habenaria tridentata* Willd. Hook. Exot. Fl. 2, pl. 81, (1825).

U. N. D. Herb. No. 9363, Notre Dame, Ind.; [Lake Co.]

(Hill); Millers, (Umbach, Higley and Raddin); Pine (Bastin); [Lake Co.] Calumet, (Babcock); Sheffield (Hill);.

*COELOGLOSSUM* Hartmann, Handb. Skand. Fl. ed. 1, p. 329, (1820).

*Habenaria* Willd. segregate.

*Coeloglossum bracteatum* (Willd.) Parl. Fl. Ital. III., p. 409.

*Habenaria bracteata* (Willd.) R. Br. 1. c. p. 192.

[Lake Co.] (Hill); Pine, Ind. (Bastin); Casella and Millers, Ind. (Higley and Raddin); U. N. D. Herb. No. 489 St. Joseph, Mich. [Berrien Co.]; No. 11156 Lapaz Junction [Marshall Co.].

*PERULARIA* Lindley, Bot. Reg. t. 1701 (1834).

*Habenaria* Sprengel Syst. 3. p. 688, (1826), segregate.

*Perularia flava* (Linn.) Rydb. 1. c. p. 292.

*Orchis flava* Linn., Sp. Pl. p. 942, (1753); *Orchis virescens* Willd., Sp. Pl. 4, p. 37, (1805); *Habenaria virescens* Spreng. Syst. 1. c.; *Habenaria flava* A. Gray, Am. Jr. Sc. v. 38, p. 308, (1840).

Lake Maxinkuckee (Clarke); [Lake Co.] (Deam); Berry Lake and Pine (Babcock); Edgemoor (Hill); Millers (Umbach).

Subfamily NEOTTIAE Pfitz. Entw. Anord. Orch. p. 45, 97, (1887).

*POGONIA* Juss. Gen. Pl. p. 65, (1789).

*Pogonia ophioglossoides* (Linn.) Ker. Lindley Bot. Reg. Pl. 148, (1816); *Arethusa ophioglossoides* Linn., Sp. Pl. p. 951, (1753).

[Marshall Co.] (Hessler); [Lake Co.] (Hill); U. N. D. Herb No. 23 [Elkhart Co.] on the Big Four R. R. from Granger to Elkhart; No. 23½ near Granger in St. Joseph Co.; I have found a pale specimen almost white in a tamarack bog at Sagunay [Laporte Co.]. Only one plant was found and was not collected. Very rare!

*TRIPHORA* Nuttall. Gen. N. Am. 2, o. 192, (1818).

*Triphora trianthophora* (Sw.) B. S. P. Prel. Cat. N. Y. p. 52, (1888); *Arethusa trianthophora* Sw. Konigl. Vet. Handb. (II.) 21, p. 230, (1800); *Pogonia pendula* Lindl. Bot. Reg. pl. 908, (1825).

[Lake Co.] (S. Coulter); Casella, Ind. (Hill); Millers (Higley and Raddin). I have never found it.

*ARETHUSA* Gronovius. Fl. Virg. 2, p. 184, (1743)

*Arethusa* Linn., Sp. Pl. p. 950, (1753); Gen. Pl. p. 407, (1754); *Orchidion* Mitchell, Gen. p. 19, (1748); also (1769).

*Arethusa bulbosa* Linn. l. c. also Amoen. Acad. 3, p. 14, (1756).  
[Lake Co.] (S. Coulter); Pine and Casella, Ind. (Higley and Raddin); Millers (Bastin and Hill).

*TRIORCHIS* Bauhin, Phytopinax p. 123, (1596); Gerard, Herbal (1597); *Triorchis* C. Bauhin, Pinax p. 84, (1623); Ray, (1688), (?); also Tabernaemontanus.

*TRIORCHIS* Petiver, Opera. Hist. Nat. Spect. Vol. II., ed. John Millan (1764!), Gazophylacium tab. 68, 7.

*Orchiastrum* Micheli, Nov. Pl. Gen. p. 30, t. 26, (1729);  
*Gyrostachys* Pers. Syn. II., p. 511, (1807); *Ibidium* Salisb., Trans. Hort. Soc. 1, p. 291, (1812); *Spiranthes*<sup>8</sup> L. C. Richard, Mem. Mus. Paris 4, p. 42, (1818).

***Triorchis plantaginea* (Raf.).<sup>9</sup>**

*Neottia plantaginea* Raf. Am. Monthly Mag. 2, p. 206, (1818);  
*Spiranthes plantaginea* (Raf.) Torrey, Fl. N. Y. 2, p. 284, (1843);  
*Gyrostachys plantaginea* (Raf.) Britton, Ill. Fl. 1, p. 470, (1896);  
*Ibidium plantagineum* (Raf.) House, Bull. Torr. Bot. Cl. p. 381, (1905); *Gyrostachys latifolia* (Torr.) Kuntze, Rev. Gen. Pl. p. 664, (1891). *Spiranthes latifolia* Torr. Lindley Gen. and Sp. Orch. p. 467, (1840); *Spiranthes lucida* (H. H. Eaton) Ames. Man. Rob. and Fernald. p. 314, (1908); *Neottia lucida* H. H. Eaton Descrip. Pl. Troy (1832).

Notre Dame, Ind., N. D. U. Herb. No. 11204; Chain Lakes [St. Joseph Co.] Nos. 533, 2483.

***Triorchis cernua* (Linn.).**

*Ophrys cernua* Linn. Sp. Pl. p. 946, (1753); *Gyrostachys cernua* (Linn.) Kuntze, Rev. Gen. Pl. p. 604, (1891); *Spiranthes cernua* L. C. Rich., Orch. Am. p. 37, (1891).

[Lake Co.] (S. Coulter); Lake Maxinkuckee (Clarke); No. 9391 U. N. D. Herb. Notre Dame, Ind.; No. 757 Tamarack, Ind. [Laporte Co.]; No. 2021 Notre Dame collected by Powers.

<sup>8</sup> For other synonyms see Kew. Ind. and MacMillan, Met. Minn. p. 170, (1890).

<sup>9</sup> The name *Triorchis* antedates the other names for the genus, and is therefore the oldest name since 1753 as well. The name is first found in Millan's Edition of Petiver's works, published in 1765!

*Triorchis gracilis* (Bigelow)<sup>10</sup>.

*Spiranthes gracilis* (Bigel) Beck, Bot. p. 343, (1833); *Gyrostachys gracilis* (Bigel) Kuntze, l. c.

Michigan City, Ind. [Laporte Co.] (C. D. Mell); [Lake Co.] (S. Coulter).

*PERAMIUM* Salisb., Trans. Hort. Soc. 1, p. 301, (1812).

*Goodyera* R. Br. Ait. Hort. Kew. Ed. 2, 5, p. 197, (1813); *Epipachis* Haller Helv. p. 277, (1742); ex Ludwig-Boehmer p. 357, (1760); not *Epipactis* Zinn = *Serapias*, *Orchis* nor *Epipactis* of the ancients.

Subfamily LIPARIDIDAE Lindley. Veg. King. p. 181, (1847).

*Peramium pubescens* (Willd.) MacM. Met. Minn. p. 171, (1892).

*Neottia pubescens* Willd. Sp. Pl. 4, p. 76, (1805); *Goodyera pubescens* R. Br. l. c.

Whiting, Ind. (Hill); [Lake Co.] (Hill); Stephenville, Mich. [Berrien Co.]; No. 2770 U. N. D. Herb.

PSEUDORCHIS J. Ray. Syn. p. 387, (1690), also *Morison*, an. *Pseudo Orchis* Dodonaeus (?)

PSEUDORCHIS S. F. Gray Nat. Arr. Br. Pl. 2, p. 213, (1821). *Liparis* Rich. Mem. Mus. Paris 4, p. 43, (1818) segregate; *Leptorchis* Thouars, Nouv. Bull. Soc. Philom. p. 314, (1808), segregate. *Paliris* Dum. Fl. Belg. Stam. p. 134, (1827); *Sturmia* Reichenb. in Moessler. Handb. ed. 2, II., p. 1576, (1828).

*Pseudorchis Loeselii* (Linn.) S. F. Gray l. c.

*Paliris Loeselii* (Linn.) Dum. l. c.; *Leptorchis Loeselii* (Linn.) MacM. l. c. p. 173, (1892); *Ophrys Loeselii* (Linn.) p. 947, (1753); *Liparis Loeselii* (Linn.) Rich. Lindley Bot. Reg. pl. 882, (1825)

Clarke, Ind. [Lake Co.] (Umbach); [Lake Co.] (Hill); Lake Maxinkuckee (Clarke); Millers (Higley and Raddin); S. Chicago, Casella (Hill); Pine (Bastin); U. N. D. Herb. No. 3327; Rum Village S. of South Bend, Ind.

LEPTORCHIS Thouars l. c.

*Liparis* L. C. Rich. l. c.

<sup>10</sup> Some other members of the genus that may be transferred under the genus name TRIORCHIS, from other parts of the country are:

*T. stricta* (Rydb.), *T. ochroleuca* (Rydb.), *T. odorata* (Nutt.), *T. praecox* (Walt.), *T. linearis* (Rydb.), *T. Grayi* (Ames.), *T. romanzoffiana* (Cham.), *T. ovalis* (Lindl.).

*Leptorchis liliifolia* (Linn.) Kuntze, Rev. Gen. Pl. p. 671, (1891).

*Ophrys liliifolia* Linn. Sp. Pl. p. 946, (1752); *Liparis liliifolia* L. C. Rich. l. c.

Lake Maxinkuckee (Clarke).

*CORALLORHIZA* Ruppius, Fl. Jen. (1718); R. Br. Ait. Hort. Kew. ed. 2, 5, p. 209<sup>1</sup> (1813); Gmelin, Fl. Sib. 1, op. 25, (1747); Haller. Hist. Stirp. Indig. Helv. II. p. 159, (1768); also p. 248, (1742); *Rhizocorallon* Hall. in Rupp. Fl. Jen. ed. 3, p. 301, (1745); *Coralliorhiza* Aschers. Fl. Prov. Brand. 1, p. 697, (1864).

*Corallorhiza odontorhiza* (Willd.) Nutt. Gen. 2, p. 197, (1818).

*Cymbidium odontorhiza* Willd. Sp. Pl. 4, p. 110, (1805).

Lake Maxinkuckee (Clarke).

*Corallorhiza trifida* Chat.

*Corallorhiza Corallorhiza* (Linn.) Karst. Deutsch. Fl. p. 448, (1880-1885); *Corallorhiza innata* R. Br. l. c. 5, p. 209, (1813); *Ophrys Corallorhiza* Linn. Sp. Pl. p. 945, (1753).

Berry Lake, (Hill).

*CATHEA* Salisb., Trans. Hort. Soc. 1, p. 300, (1812).

*Helleborine* Martyn, Hist. Pl. t. 50, (1736), not *Helleborine* Dodonaeus, Matthioli, etc. *Limodorum* Gronovius. Fl. Virg. p. 110, (1739), Linn. Sp. Pl. p. 950, (1753), not *Limodorum* Clusius Hist. Rev. Stirp. p. 240, (1583), nor Tour. I. R. H. p. 437, (1700); nor Els. Bot. p. 345, (1694), nor *Limodorum* Dodonaeus, Pempt. p. 552, (1583) = *Orobanche*. *Limodorum* Linn. Gen. Pl. p. 435, (1742); p. 407, (1754); also Royen Fl. Leyd. p. 16, (1740).

Subfamily THUNIINAE Pfitz l. c. pp. 149 and 100

*Cathea tuberosa* (Linn.) MacM. Met. Minn. p. 175, (1893).

*Limodorum tuberosam* Linn. l. c.; *Calopogon pulchellus* R. Br. l. c.; *Calopogon tuberosus* B. S. P. Cat. N. Y., (1898); *Helleborine tuberosa* (Linn.) Kuntz l. c. II., p. 665 (1891); *Cathea pulchella* (Sw.) Salisb. l. c.; *Cymbidium pulchellum* Willd. Sp. Pl. 4, p. 105, (1805); also Sw. Nov. Act. Soc. Sc. Upsal. VI. (1799).

Pine, Ind. (Umbach); [Lake Co.] (Hill); [St. Joseph Co.] (Barnes); Lake Maxinkuckee (Clarke); U. N. D. Herb. Nos. 3324, 9505, 2330 (2). Near Lawton, Mich. [Van Buren Co.]; Nos. 9154, 9022, 882. Chain Lakes [St. Joseph Co.]; No. 2745 Sagunay [Laporte Co.]; No. 7706 Dune Park, Ind. [Lake Co.]; No. 22



Big Four Railroad, Granger to Elkhart [Elkhart Co.]; also in St. Joseph Co. near Granger, growing with *Pogonia ophioglossoides* (Linn.) Ker.

Subfamily SOBRALIINAE Pfitz l. c. p. 99.

*APLECTRUM* Nutt. Gen. 2, p. 197, (1818).

*Apectra* Raf. Cat. 13, (1824); *Amplectrum* Hooker, Fl. Bor. Am. 2, p. 197, (1840).

*Aplectrum spicatum* (Walt.) B. S. P. Prel. Cat. N. Y., 5, (1888); *Apectra elatior* Raf. l. c. *Arethusa spicata* Walt. Carol p. 222, (1788); *Cymbidium hyemale* Willd. Sp. Pl. 4, p. 107, (1805);.

Berry Lake (Higley and Raddin); Y. N. D. Herb. No. 9364 Rum Village, S. of South Bend; also 10569 (2), and No. 11205 from the same place. Not very scarce yet. Found also at Munich, Mich.

[To be Continued.]

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## Migration of Our Birds in the Autumn of 1912.

BY BROTHER ALPHONSUS, C. S. C.

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In August the dates of migration of the Scarlet Tanager, Yellow Warbler, Red-eyed Vireo, and possibly the Hummingbird, Barn Swallow, Loggerhead Shrike and Orchard Oriole are likely not the actual time of leaving for these species. The dates given are those days when the writer last had an opportunity of visiting places where these species are commonly found.

Other species that were not seen in August were: Bobolink, Dickcissel, Rose-breasted Grosbeak, Yellow-throated Vireo, Maryland Yellowthroat, Alder Flycatcher, Phoebe, Tree Swallow, Long-billed March Wren and Bittern. Some of these species were not observed because the writer was unable to go to a favorable locality where the birds are usually found; in the case of the Dickcissel no record of the species was made during the year; the Rose-breasted Grosbeak migrated in spring and the Bobolink early in summer.

The date of migration for the Kingbird is the earliest I have yet recorded, being 10 or 11 days sooner than any previous records.

The last day I saw the species, a number of birds were bathing in a lake late in the afternoon. Was this bathing preparatory for a night flight? I can not say what determined the birds to leave so many days ahead of their usual time for migrating. In fact the more observations I make on the migration of birds, the clearer it becomes to me that it is quite beyond our efforts to give a satisfactory reason for the differences noted in the time of migration of most species.

A species that is sure to leave in autumn within one or two days of a certain date is the Baltimore Oriole. This regularity is quite exceptional, for I can not find another species that shows such nearness in its dates of migration. As in the cases of disparity in the dates of migration so in this instance of regularity, I can not say what was the determining cause of the birds' movements.

A number of species were recorded but once in certain months, this date being selected as the one before the day of migrating. Such records were made of the Redstart, Crested Flycatcher and Vesper Sparrow in September; House Wren, Flicker, Sapsucker, Yellow Palm Warbler, Hermit Thrush, Sparrow Hawk, Greater Yellowlegs and Red-breasted Nuthatch in October; Bluebird, Purple Grackle, Cardinal, Canada Goose and Hairy Woodpecker in November; Northern Shrike in December. The fact that these species were seen but once would seem to indicate that the individuals were migrating birds. There is some probability that on certain days the writer may have missed a number of these species, and thus failed to obtain the true dates of their migration.

The writer wishes to call attention to the only record he made of the Hermit Thrush this autumn—October 13. In two previous years, this species appeared late in August, making the date of arrival this year 44 days later than the earliest arrival on August 29, 1910. Who can furnish a clue to this case of remarkable disparity in dates of migration?

#### AUGUST.

2 Scarlet Tanager	19 Barn Swallow
5 Spotted Sandpiper	20 Orchard Oriole
6 Yellow Warbler	22 Kingbird
6 Red-eyed Vireo	29 Bobwhite
12 Loggerhead Shrike	31 Wilson Warbler
14 Hummingbird	31 Cedarbird

## SEPTEMBER.

3 Crested Flycatcher	18 Wood Pewee
4 Chipping Sparrow	20 Whip-poor-will
4 Red-breasted Nuthatch arrived	20 Redstart
5 Baltimore Oriole	22 Indigo Bird
5 Purple Martin	23 Mourning Dove
9 Red-headed Woodpecker	25 Phoebe arrived
11 Herring Gull arrived	25 Yellow-billed Cuckoo
13 Brown Thrasher	26 White-throated Sparrow arrived
13 Warbling Vireo	28 Golden-crowned Kinglet arrived
14 Pine Warbler	28 Snowbird arrived
17 Black-throated Green Warbler	29 Chimney Swift
18 Catbird	30 Vesper Sparrow
30 Myrtle Warbler arrived	

## OCTOBER.

3 Sapsucker	19 Sparrow Hawk
4 Phoebe	21 Killdeer
8 House Wren	25 Tree Sparrow arrived
11 Cowbird	25 Chickadee arrived
12 Yellow Palm Warbler	25 Greater Yellowlegs
13 Hermit Thrush	25 White-throated Sparrow
15 Meadowlark	26 Red-breasted Nuthatch
15 Flicker	27 Robin
16 Field Sparrow	27 Kingfisher
16 Hell Diver	27 Myrtle Warbler

## NOVEMBER.

1 Red-winged Blackbird	13 Cardinal
8 Bluebird	18 Canada Goose
8 Golden-crowned Kinglet	19 Goldfinch
8 Purple Grackle	22 Hairy Woodpecker
25 Northern Shrike arrived	

## DECEMBER.

1 Herring Gull	8 Northern Shrike
6 Tree Sparrow	15 Song Sparrow
	14 Chickadee
Total number of migrants seen, 64.	

## An Older Name for *Listera*.

BY J. A. NIEUWLAND.

Apart from the fact that the name *Listera* R. Brown,<sup>1</sup> was preceded by an older name *Listeria* Necker,<sup>2</sup> it is not even the oldest for the orchidaceous genus, whether we hold to absolute historical priority as a principle of or chose 1753 as a starting point. Of course Necker's name and Brown's name seem practically the same and named in honor of the same scientist. This is evident from the fact that *Listera* R. Br. was changed by Sprengel to *Listeria*.<sup>3</sup>

In 1764 an edition of Petiver's works was made by John Millan.<sup>4</sup> The old name *Bifolium* which these plants had since the time of Lobelius,<sup>5</sup> Ray,<sup>6</sup> Morison,<sup>7</sup> Dodonaeus,<sup>8</sup> Parkinson,<sup>9</sup> Chabreaus,<sup>10</sup> etc., is given to them, thus antedating any even since 1753. I shall only transfer the most well known of the genus:

*Bifolium* (Lobelius) Petiver-Millan, Opera, tab. 70, Nos. 10, 11, 12.

*Listera* R. Brown (1813) l. c. not *Listeria* Necker, (1790) l. c.

*Diphryllum* Raf. Med. Rep. N. Y. 5, 357, (1808) (?).

*Distomaea* Spenn., Fl. Frib. 1, 245, (1825); *Pollinirhiza* Dulac. Fl. Pyr. p. 120, (1867).

<sup>1</sup> Brown R., in Ait. Hort. Kew. ed. 2, 5, p. 201, (1813).

<sup>2</sup> Necker, J. de, Elem. 1, p. 206, (1790).

<sup>3</sup> Sprengel, C. Anleitung, II., 1, p. 293, (1817).

<sup>4</sup> Petiver, J. Opera ad Hist. Nat. Spectantia. (N. B.) "About 100 of these plates were never published before." London. Printed for John Millan near Whitehall MDCCCLXIV.

<sup>5</sup> Lobelius, M. Observationes p. 161, (1576); Adv. p. 127.

<sup>6</sup> Ray. J. Methodus Plantarum Nova, p. 157, (1682).

" Synopsis p. 375.

" Historia Plantarum p. 1232, (1686).

<sup>7</sup> Morison R. Oxon. II., p. 489, (1715). Tab. II. Sect. 12.

<sup>8</sup> Dodonaeus, R. Pempt. p. 242, (1583).

<sup>9</sup> Parkinson. J., Theatrum p. 504, (1644).

<sup>10</sup> Chabreaus, D., Sciagraphia, p. 506, (1677).

<sup>11</sup> "*Ophris*," Tournefort, Els. Bot. p. 346, (1694); I. R. H. p. 436, (1700), in stricto sensu.

<sup>12</sup> If this name be invalidated because of the existence of *Bifolium cordatum* Gaertner, 1790, I suggest the restoration of Ray's *B. minimum*.

**Bifolium cordatum** (Linn.) Nwd.*Listera cordata*. (Linn.) R. Br. l. c.*Distomaea cordata* (Linn.) Spenn. l. c.*Pollinirhiza cordata* (Linn.) Dulac. l. c.*Ophrys cordata* Linn. Spl Pl. p. 946, (1753).*Bifolium minimum* Ray. Syn. p. 385, (1724); also Petiver-Millan, Opera l. c. (1764).**Bifolium ovatum** (Linn.) Nwd.*Listera ovata* (Linn.) R. Br. l. c. *Distomaea ovata* (Linn.) Spenn. l. c. *Pollinirhiza ovata* (Linn.) Dulac, l. c. p. 121. *Ophrys ovata* (Linn.) Sp. Pl. p. 946, (1753). *Bifolium majus* Ray. l. c. also Petiver-Millan l. c.**Bifolium convallarioides** (Sw.) Nwd.*Listera convallarioides* (Sw.) Torr. Comp. p. 220, (1826).**Bifolium australe** (Lindl.) Nwd.*Listera australis* Lindley. Gen. Sp. Orch. 456, (1840).**Bifolium Smallii** (Wiegand) Nwd.*Listera Smallii* Wiegand. *Listera reniformis* Small.**Bifolium auriculatum** (Wiegand) Nwd.*Listera auriculatum* Wiegand.

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## New Plants from Various Places.—II.

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BY J. A. NIEUWLAND.

*Dasiphora fruticosa* var. **appendiculata** Nwd., nov. var.

Plant stouter than the type with the same hirsute or silky hirsute petioles, peduncles and twigs, and hirsute stems; leaves silky and hirsute, shining when young; leaflets usually few, the lower lateral inequilateral, the upper with blade running down the rachis to the lower pair, lanceolate, the terminal oblong acute at both ends. 2.2 cm. long, and many nearly 6–7 mm. wide, not notably revolute on the margins. Flowers very numerous and rather densely aggregated. Petals smaller than in the typical plant, less than 5 mm. long, lemon yellow, orbicular. Sepals triangular ovate with a long acuminate point, usually exceeding the petals. Outer bractlets considerably longer than the corolla,

lanceolate herbaceous, *having each two linear herbaceous appendages or teeth at the base one on each side.* Calyx and sepals enlarging considerably in fruit, and decidedly herbaceous.

Planta stricte erecta, floribus dense aggregatis, major quam specie; bracteolae ad basim appendice lineari indutae. Folia majora haud vel vix revoluta.

Although the plant differs most remarkably in habit from the ordinary, and has uniformly appendaged bractlets, together with the other notable characters mentioned, it is scarcely perhaps more than a cultivated variety. The specimen from which the diagnosis was made, was taken from a plant in cultivation, and at that entirely outside of its natural geographical habitat. The specimen is in the U. S. National Herbarium and is no 2943a "in cultivation at Biltmore, North Carolina," gathered "Aug. 6th, 1897."

*Dasyphora fruticosa* (Linn.) Raf. though in our region growing only in bogs, submits readily to cultivation, and usually bears widely different flowers, becomes taller, more bushy, awith crowded flowers and inflorescence. The bracts of American *Dasiphorae* are not infrequently toothed at the apex, and sometimes an occasional appendage is found at their base. I have not found such basal growths in either cultivated specimens or native grown plants in our region.

I have advisedly refused to use the older name *Pentaphylloides* (Morison) Hill (1756), though there can not be any doubt as to the identity of the plant with Rafinesque's *Dasiphora*, because names ending in *oides* are objectionable, and many writers have avoided such in spite of priority,—this in spite too of the fact that I first called attention to the synonymy of *Dasiphora*.

*Limodorum tuberosum* var. **nanum** Nwd., nov. var.

Plant small 7.5–13 cm. high, from a small ovoid bulb about 6 mm. long and half as wide; one leaved; leaf 3–6.5 cm. long, (when the plant is in flower) linear lanceolate, acute or acuminate sheathing at the base, scarcely ever 5 mm. wide; base of leaf covered by a single obtuse membranous bract completely sheathing its whole length of about 1 cm.—1.3 cm. Peduncle often having near the middle a minute ovate clasping bract. The successive years' shoots arise from a bulb at the end of short offsets about 7 mm. long. Flowers only 2 or 3, racemose, erect, the sessile ovary subtended by a membranous, ovate, somewhat acuminate

pointed bract clasping at the base, and usually more than half as long as the ovary, the latter ordinarily about 7 mm. long in anthesis. Flowers dark purple, lateral sepals, ovate to obovate and lanceolate, twisted upwards with an acute, acuminate, or abruptly mucronate or aristate apex. Lower sepal narrower slightly carinate towards the base, not over 1.6 cm. long. Petals acute or obtuse at the apex, broader near the base, lanceolate oblong or obspatulate because of an abrupt blunt tooth below the middle. Lip bearded within with a triangular winged apex, slightly retuse, mucronulate or obtuse. Claw linear, column dark purple to black; pollen masses orbicular, dark purple to black without.

*Planta perparva* 7.5-13 cm. *alta cum duobus vel tribus tantum floribus*, et *folio perparvo lineari* 3-6.5 longo et *vix* 5 mm. *lata*. Flores *purpurei minores quam in specie*; *pollinia suborbicularia, atra*.

Type No. 609580 also 609581 U. S. National Herbarium collected by J. D. Sornburger, Aug. 28, 1903 and Aug. 12, 1903 on the Barred Islands, Coast of Newfoundland. The remarkably small size of the plant shows it at first sight as peculiar. The floral bracts are relatively longer and the flowers smaller. The raceme is always few flowered. Intermediate forms apparently between this and our plants of the United States are met with in Nova Scotia, but the Newfoundland plant has so remarkably different an aspect and so many minor differences that it seems to deserve at least varietal standing.

*Persicaria punctata* var. *tacubayana* Nwd., nov. var.

Plant glabrous, stem erect or ascending. Leaves oval, ovate to elliptical seldom ovate lanceolate; cuneate at the base, rounded or obtuse at the apex, in the upper undeveloped leaves sometime acutish, or attenuate to a blunt apex, 2.7 x 3 to 4.5 x 6.5 cm. on flowering shoots, light green above minutely but densely cinereous punctulate beneath; margin entire, in younger leaves sparsely and minutely appressed ciliate; petiole .6-1 cm. long slender; ochrea membranous, glabrous, 1-1.6 cm. long without bristly ciliation, often with short excurrent veins in the upper parts of the plant, cylindric sometimes wider at the base. Upper nodes 3-6.5 cm. long. Raceme erect 4-4.5 cm. long, lower flower about 1 cm. distant from the others and separating to about 2.5 cm. in fruit. Flowering peduncle 2.5-3 cm. long elongating in fruit to 5.5-7 cm.



Ochreolae narrowly funnel form, rose-purple at the apex, glabrous, scarcely inbricate even when the flowers are in bud. Pedicels about 5 mm. long slender in flower. Calyx glandular punctate, white above greenish below and attenuate at the base, 2 mm. long in flower and about 3 mm. in fruit, segments ovate to obovate. Stamens 5 included, style 2-cleft to a little below the middle. Fruit trigonous 2 mm. long, black and lustrous.

Planta glabra cum foliis ovalibus, ovatis, vel ellipticis. Folia basi cuneato, apice rotundato, obtuso vel in foliis junioribus, apice acutiusculo, 2.7x4.5 cm. vel 3x6.5 magnitudine. Folia in facie superiore viridia, inferiore quidem cinereo-puncticulata, petiolis .6-1 cm. longis, ochreis membranosis, glabris, haud ciliatis. Nodi 3-6.5 cm. longi. Pedunculus cum floribus 2.5-3 cm. et cum fructu 6.5-7 cm. longus. Ochreolae infundibuliformes roseo colore glabrae minime imbricatae. Pedicelli circa 5 mm. longi. Calix glanduloso-puncticulatus, viridescens, circa 2 mm. longus, ejus partes ovatae vel obovatae. Stamina 5. Stylus infra medium divisus et fructus ater triangularis, 2 mm. longus.

Type of description No. 316887, U. S. National Museum Herbarium, Pringle's No. 6656, labelled *Polygonum acre* collected in Tacubaya Federal District, Mexico, July 26, 1897. The plant differs from *P. punctata* var. *eciliata* Small in the shape of the leaves. The racemes are shorter, and the style not cleft to the base. The leaves are all nearly of uniform size.

*Chamaenerion latifolium* var. *megalobum* Nwd., nov. var.

Plant rather larger than the type over 3.5 dm.; stem erect or somewhat assurgent, glabrate or sparsely puberulent above. Leaves 2.5-6 cm. or more in length and 7-13 mm. or more wide, glabrous on the surface and minutely and sparsely pubescent below slightly cinereous when young, oblong to oblong-lanceolate, obtuse, cuneate, short petiolate or subsessile, sometimes opposite at the middle of the stem or above. Sepals oblong lanceolate downy without. Petals obovate apparently whitish or pale, narrowed to a claw. Peduncle 2.5-5 cm. long in fruit, capsules curved outward in flower by an abrupt twist at the base. Fruiting capsules straight, truncate at the apex and appearing as if somewhat beaked, gradually tapering at the base, very long, often over 10 cm. Coma of the seeds 1.2 cm. long, pods whitish pubescent especially when young.

*Planta major quam in specie, 3.5 dm. alta vel altior, erecta vel assurgens, glabrata vel sparse puberulens. Folia 2.5-6 cm longa et 7-13 mm. lata vel latior, glabra vel pubescentia in facie inferiore, juvenilia cinerea, oblonga vel oblonga-lanceolata, obtusa, cuneata, breviter petiolata vel subsessilia. Sepala oblonga-lanceolata. Petala obovata versimiliter albescentia. Pedunculus 2.5-5 m. longus. Fructus truncatus, ad basim attenuatus saepius 19 cm. longus.*

Type No. 455 collected by Edw. R. Heacock at an altitude 1500 m. at Cheops Draw, British Columbia in the Selkirk Mountains. The most notable characters are the very large fruits and paler flowers, as also the peculiar habit and size of the plant.

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### Book Note.

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#### HANDBOOK OF THE WILD AND CULTIVATED FLOWERING PLANTS.

By C. A. Darling, Ph. D. Pocket edition; New York, 1912; pages VIII+264. Published by the author.<sup>1</sup>

This splendid book is one that will appeal to a large class of persons in the eastern and central states. By means of well arranged and carefully worded keys the author places the determination of the common plants of the field and garden within the reach of those who have not had opportunity for advanced botanical training. The omission of technical terms and the use of easily observed gross characters will make the book attractive to many who do not care for the technical manuals.

Presentation in such a way as to bring the matter within the reach of the untrained has not detracted at all from the scientific accuracy of the work. There are four general keys to the genera; (1) Key to the Wild Plants and Cultivated Trees and Shrubs which flower during March, April, and May; (2) Key for June to November; (3) Key to the Wild and Cultivated Trees and Shrubs in Autumn; and (4) Key to the Cultivated Herbs and Potted Shrubs. Following these keys are descriptive keys to the species with both the common and scientific names, arranged and classified in their orders and families. This arrangement makes

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<sup>1</sup> The book can be obtained by addressing the author, care Department of Botany, Columbia University, New York City.

the book especially suited for high school pupils and beginners in botany in college. The inclusion of the cultivated plants is a very welcome addition. From the parks and gardens these plants are always falling into the hands of the student and the disappointment which arises when no trace can be found in the older manuals is familiar to every teacher. This scheme which recognizes the wild and cultivated forms in the same work is commendable not only because it facilitates determination but also because it may throw a new light on relationships.

F. D. K.

Purdue Univ.

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### ***Viola arvensis* Murr. in Northern Indiana.**

BY J. A. NIEUWLAND.

It is not all certain that the plant generally reported for the midland as *Viola Rafinesquii* Greene, is really that plant in all cases. I have noted a number of such in the U. S. National Herbarium as being really the European *Viola arvensis* Murr.; a plant long confused with the other. I have never found *V. Rafinesquii* in the middle west, but I have found the other plant, introduced in several rather widely distant places in St. Joseph County, growing in waste places and dry sandy fields left uncultivated for some years. In two places particularly at Webster's Crossing and at the Four Mile Bridge. *Viola arvensis* not only maintains itself well, but is spreading considerably. This plant has been omitted from Britton's Floras, presumably as not occurring in the United States east of the Mississippi River and presupposing possibly and mistakenly that the plant reported in our region is *Viola Rafinesquii*. *Viola tricolor* Linn., the small flowered plant from which our numerous cultivated forms are derived, has also escaped at Notre Dame, but is not as well able to maintain itself in waste places.

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Pages 64-78, published April 1, 1813.

Page 62 should be 64 and 76 is 78; each page number between should read two numbers higher.

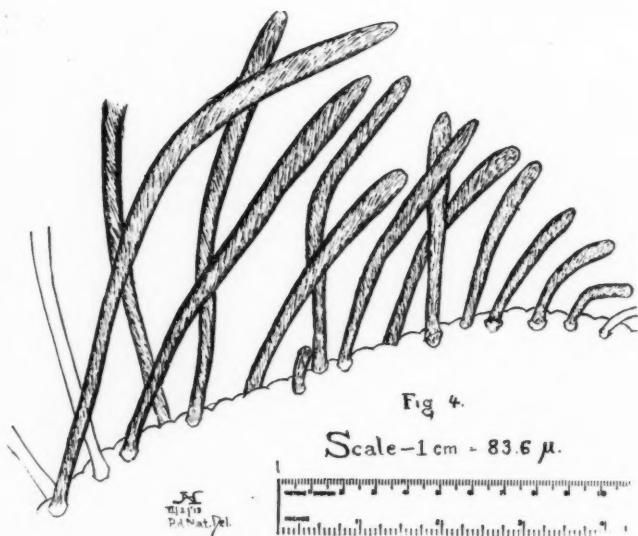
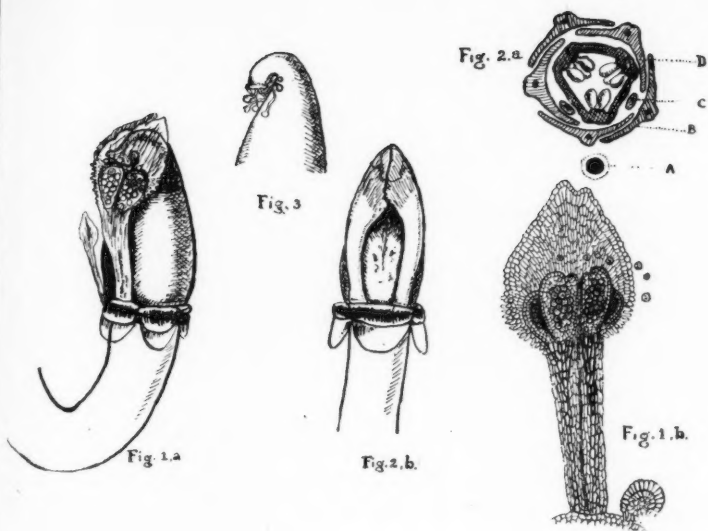


PLATE III. NIEUWLAND—A NEW MIDLAND VIOLET, ETC.

